The RUBBER AGE

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LATE NEWS of the Industry

Tire Dealers' Stock Survey Indicates Lowest Average Inventory Since 1927

PRELIMINARY statistics covering dealers' stocks of automobile tires in the United States as of October 1 have been issued by the Rubber Division of the Department of Commerce, and disclose a sharp decrease in comparison with the average stocks on the same date in the past two years. According to the returns reported from 23,971 dealers, the average stock of automobile and truck casings per dealer was only 60.4 as compared with 68.4 casings in stock on October 1, 1929, and 64.8 casings on the same date in 1928.

In the past, the average stock per dealer figure of the preliminary report has been raised slightly after tabulation of late returns for the final report which is issued at the end of the month. According to the Department of Commerce, however, it is not anticipated that the final report in the present survey will raise the average casings per dealer figure by more than from 0.5 to 2.0 casings per dealer.

The complete preliminary figures show that the 23,971 dealers held a total stock of 1,448,358 casings, while 1,084 dealers held 24,845 solid and cushion tires. The final report for October 1, 1929, indicated that 25,417 dealers had a total of 1,739,043 casings, with 1,032 dealers showing 24,940 solid and cushion tires.

Inner tube inventories showed an even sharper decline in the current survey. Stocks of 24,031 dealers totaled 2,095,762 tubes, an average of 87.2 per dealer, whereas in the 1929 survey 25,079 dealers held 2,592,355 tubes, an average of 103.4.

Dealers reporting stocks of high pressure casings were tabulated separately: 17,890 dealers reported 255,927 high pressure casings in stock, or 14.3 per dealer, while on October 1, 1929, 20,045 dealers reported 459,001 high pressure casings, or 22.9 per dealer.

An analysis by volume groups has been prepared of the reports from dealers having stocks of casings, and a comparison made to the survey of last year. This year a greater percentage of reports fell into the classes of dealers having less than 50 casings in stock, a smaller percentage of reports falling into the classes of dealers having 50 or more casings in stock.

The Department of Commerce spring survey, taken as of April 1 this year, showed that the average stock of the dealers reporting was 83 casings, indicating a reduction in the six months of 22.6 casings per dealer. The survey taken as of April 1, 1929, showed the average dealer with 94.4 casings in stock, a figure that was reduced in the fall survey by 26 casings.

A comparison between the preliminary statistics for October 1, 1930, and the final statistics for October 1, 1929, is made in the following table:

	October 1, 1929			*October 1, 1930*		
	Number	*Dealers Reporting*	*Average Per Dealer*	*Number*	*Dealers Reporting*	*Average Per Dealer*
Total casings	1,739,043	25,417	68.4	1,448,358	23,971	60.4
High pressure casings	459,001	20,045	22.9	255,927	17,890	14.3
Inner tubes	2,592,355	25,079	103.4	2,095,762	24,031	87.2
Solids, etc.	24,940	1,032	24.2	24,845	1,084	22.9

Col. Ayres, Noted Economist, Predicts Real Tire Shortage Is in the Making

THAT a "real tire shortage" is in the making is predicted by Colonel Leonard P. Ayres, vice-president of the Cleveland Trust Company and nationally known economist, in his latest statistical bulletin. He believes that the early days of next spring will find an unprecedented demand for automobile casings with the supply in the hands of dealers and manufacturers at very low levels.

"Rubber companies," says Colonel Ayres, "have suffered even greater curtailment of their sales and more serious inventory losses this year than have most other kinds of industrial corporations. This is particularly true of the companies making automobile tires.

"There are two chief reasons for the present misfortunes of the tire companies. The first is that American motorists have been economizing in their expenditures this year and postponing the replacement of tires on their cars to a degree that is truly astonishing. The second reason is that crude rubber which was carried last year in company balance sheets at around 20 cents a pound is now worth about 7 cents a pound, and so severe inventory writedowns have been necessary, amounting in the cases of some of the large companies to more than a million dollars for each cent of shrinkage in the price of rubber per pound."

Colonel Ayres comes to his conclusion of a probable tire shortage by a study of comparative records of the number of cars in use, the amount of gasoline consumed and the number of tires sold to car owners for replacements. Charting these three indices with the ten-year average of

each as a base, he found that all advanced together somewhat irregularly until 1930 was reached. Then gasoline consumption continues to advance at an almost normal rate, as do the number of cars in use, while tire sales decline to levels below those of 1925.

"Clearly," comments Colonel Ayres upon this showing, "the consumption of new replacement tires this year is far below normal. People have continued to use their cars about as much as formerly, but they have made their old tires continue in service a good deal longer. Millions of American automobile owners are going into the autumn and winter with tire treads worn smooth and thin. The prospects are that when the first hot days of spring come there are going to be unprecedentedly numerous blowouts. Tires are more durable than ever before, but, nevertheless, they eventually wear out."

Goodyear Begins Four Six-Hour Shifts; Goodrich to Make No More Curtailments

DISCONTINUING its recently inaugurated "rotation" plan of employment, the Goodyear Tire & Rubber Company at its Akron factories has established a new labor set-up which provides four six-hour shifts a day with each factory employe allotted 24 working hours each week. The new plan was formally announced by C. C. Slusser, vice-president and factory manager, on October 14 after a week's trial in the company's reclaiming plant.

Its application to the entire factory is to be started immediately in some departments and extended throughout the plant as speedily as possible. Office and factory office employes are not affected by the ruling.

The new departure replaces the labor rotation system Goodyear pioneered in Akron and, it is believed, will save thousands of workers from the hardship of complete unemployment.

Mr. Slusser's order replacing the plan in effect follows in full:

"In July of this year Goodyear management decided to put employment rotation into effect to avoid layoffs and at the time we instituted this plan we told the Goodyear employes there would be one day off in eight. As business has receded, making necessary further reductions in production, we have kept moving this back to one day off in seven, one in six, one in five, then to the point where the majority of our people are working only four days a week.

"It has now become necessary to further reduce operations and to reduce the number of lay-offs we are going to try six-hour shifts working four shifts in the 24 hours, midnight to 6 a. m., 6 a. m. to noon, etc.

"For the present, we will operate four days a week, giving each employe 24 hours each week. With this small number of hours it will be practically impossible for us to do any rotating of employment although we are going to review the problem and, wherever rotation will help keep the maximum number of people at work, it will be used.

"This six-hour shift is not to be construed as a permanent proposition at Goodyear, but is only a temporary measure until business justifies return to an eight-hour day and a 48-hour week and employment not only for our present force but, we hope, for a large number of former employes.

"The late fall is always the low period in the rubber industry. Dealers are reducing inventories, preparatory to placing spring dating orders. When these orders start coming in December or early January, we are hopeful of improved working conditions throughout the Goodyear factories."

Following a labor survey, the B. F. Goodrich Company has virtually decided to abstain from any further curtailments for the remainder of the year. "So far as we now know," says J. D. Tew, president, "there will be no further curtailments between now and the first of the year. Should there be occasion to rehire men, they will be selected from among former Goodrich employes in Akron."

Of the labor survey, the formal statement says: "This study of labor and inventory requirements, undertaken months ago in anticipation of now existing conditions in Akron, has already resulted in adjustments to assure continued employment for as many employes in factory departments as possible.

"Inventories are continually under observation. Wherever increased sales are indicated they are being anticipated by increased production. In certain departments a plan of labor rotation was put into operation where it was found that this method would fulfill production needs, in order to retain at the same time, the majority of the personnel. For other departments the six-hour shift was advisable to achieve the same result.

"The Goodrich company, realizing its responsibilities during this period, is attempting to relieve problems of depression sanely, and the present policy is now giving employment to several thousand more Akron workers than would be necessary if production were accomplished on the normal basis."

Henderson, Retiring as Exchange Head, Sees Future Rubber Trade Prosperity

THE depression in the rubber industry is bringing economies of operation which will result in placing it on a sound basis for future prosperity, F. R. Henderson, retiring president of the Rubber Exchange of New York, said on October 14, in his report for the year ended August 31 last, made public at the annual meeting of the Exchange.

"The rubber industry has not escaped the effects of world wide economic adjustment in the period under review," the report said. "Perhaps the effect on our industry has been more acute because of conditions peculiar to it.

"In the period of enforced production curtailment and the abnormal price level of 1925-1926, the native population of the British and Dutch East Indies planted rubber to an extent unknown until the vast quantities appeared at shipping points in the last year. This additional production came on a market facing under-consumption and partially discounting price effect. The result has been record low levels and accompanying disturbance to consumer as well as producer.

"It seems safe to say that we are entering the constructive period after all this and while losses in many instances will be revealed, economies of operation will result in a sound rebuilding."

Commenting upon the decrease of nearly 20,000,000 units in tire production for the first seven months of 1930 compared with the same period in 1929, Mr. Henderson said:

"The noteworthy feature of tire production is the adjustment of manufacture to sales. This augurs well for the upturn in general business and the underlying health of this important part of our rubber consuming industry." Mr. Henderson estimates 1930 world rubber production at over 840,000 tons, with consumption at 700,000 tons.

During the fiscal year future contracts representing 247,842½ long tons of rubber were traded in on the Ex-

change, with an approximate value of $84,000,000. Prices per pound for the No. 1 Standard contract ranged from a low of 9.55 on Aug. 19 last to a high of 17.40 on April 1 last; for the A contract from a low of 9.40 on Aug. 19 last to a high of 22.60 on Sept. 11, 1929. During the fiscal year ended August 31, 1929, there were 470,330 tons of rubber traded in on the Exchange, representing a value of $217,000,000.

The members of the Exchange approved the recommendation of the Board of Governors fixing the annual dues for the ensuing year at $250.

United States Rubber Consumption Totaled 25,288 Tons During September

CONSUMPTION of crude rubber by manufacturers in the United States for the month of September is estimated at 25,288 long tons by the Rubber Manufacturers Association, Inc., in its monthly statistical compilation. This represents a sharp drop from the August consumption of 30,575 long tons and is still further below the September, 1929, figure of 34,707 long tons and the September, 1928, figure of 39,882 long tons.

Nine months' consumption, based on the association's first two quarterly reports and the July, August and September monthly figures, was 298,810 long tons, equal to only 78 per cent of the total of 381,603 long tons used in the same period last year. This 22 per cent decline, reflected chiefly in tire production, has been due to the abnormal business conditions this year and the necessity for reducing inventories of manufactured goods.

Imports of crude rubber into the United States during the month of September totaled 39,467 long tons, according to the association's estimates, comparing with its own figures of 34,558 long tons for August.

The association estimates that total domestic stocks of crude rubber on hand and in transit overland September 30th rose to a new peak of 169,607 long tons as compared with 158,178 long tons as of August 31st and 84,362 long tons as of September 30th, 1929. Crude rubber afloat for United States ports is estimated at 60,923 long tons as against 61,168 long tons on August 31st and 58,758 long tons the same date a year ago.

August Tire Output Below Shipments; Stocks Lowest Since October, 1928

INVENTORIES of pneumatic casings on hand August 31st were at the lowest levels since October 31, 1928, according to statistics issued by the Rubber Manufacturers Association, Inc. This organization reports 11,570,885 casings on hand August 31st, a decrease of 8% under July 31st of this year and 19% below August 31st a year ago.

Shipments of pneumatic casings for the month of August amounted to 5,519,867 and represent a decrease of 5% under July, 30% under August, 1929, and 34% under August, 1928. Production of pneumatic casings for the month of August is placed at 4,443,319, an increase of 4% over July, although 23% under August a year ago and 41% below August, 1928.

Shipments of pneumatic casings for the first eight months of 1930 exceeded production by 2.5% as compared with a 1% excess of production over shipments in same period of 1929, and .6% in 1928.

August inner tube production was also under shipments for the month, keeping inventories down to the lowest point since December, 1925. Similar trends were apparent in solid and cushion tires, shipments exceeding output and stocks continuing at the lowest level in years.

The tire industry is estimated to have consumed 54,314,055 pounds of crude rubber and 17,630,579 pounds of cotton fabric during the month of August in the manufacture of all types of pneumatic casings, tubes and solid and cushion tires.

The association's estimates are based on reports furnished by manufacturers who produce approximately 75 per cent of the total for the United States, but have been adjusted to represent 100 per cent in the above figures.

United States Rubber to Buy Control Of the Samson Tire & Rubber Company

DIRECTORS of the United States Rubber Company at their October meeting authorized the acquisition of a controlling interest in the Samson Tire & Rubber Corporation, of Los Angeles, Cal. The acquisition will be made through the medium of a new corporation presently to be formed.

This step is to be taken, according to F. B. Davis, Jr., president of the United States Rubber Company, pursuant

Administration Building of the New Samson Factory at Los Angeles

to a plan which has for its aim the merging of the interests of that company and the Samson company in the tire business on the Pacific coast. The plan for the acquisition of control calls for the exchange by the shareholders of the Samson company of their present holdings of common stock for preferred stock in the new company.

Rumors of negotiations toward such a merger had been current since the end of September, following a visit by A. Schleicher, president and founder of Samson, to the East to confer with officials of the United States Rubber Company. The move will give United States Rubber a plant of its own on the Pacific coast, placing it on an equality in that respect with the other three of the country's four largest tire and rubber companies. The Samson Tire & Rubber Corporation has a capacity of about 10,000 tires a day at its plants located in Los Angeles, Compton and San Diego. The company's new plant on Telegraph Road, Los Angeles, has a daily capacity of 6,000 tires and 10,000 tubes.

Organized in 1917 as the pioneer tire manufacturing firm on the Pacific coast, the Samson company has grown rapidly. By 1925 its gross sales had mounted to an annual total of $4,066,453, and in the eleven months ended November 30, 1928, sales amounted to $7,605,410.

Elect Rubber Exchange Officers

New officers of the Rubber Exchange of New York were elected on October 21 and have assumed the duties of their positions. The new officials include John L. Julian, president; William A. Overton, vice-president; and J. Chester Cuppia, treasurer, the latter two having been re-elected. The members re-elected nine former directors and elected three new directors at the same time.

(Other news of the industry will be found on Pages 89-95)

Rubber Reclaiming Methods

Accident Experience in Past Has Not Been Good But is Steadily Greater Liability of Risk—But Most Accidents Are Due

By A. P.
Philadelphia Rubber

IT has been suggested that relatively few rubber men are familiar with reclaiming processes or equipment, and would welcome a description of the machinery and methods, with specific reference to the safety hazards, and some things we are doing to improve unsafe conditions.

Because we sell only to the manufacturer of rubber goods, the magnitude of our industry is not apparent to many, but to say that the amount of reclaimed rubber consumed is half that of crude, in other words reclaimed rubber constitutes one-third of all rubber products, may make the comparison a little clearer. Two hundred and fifty thousand tons, or five hundred million pounds per year of reclaimed are used in this country, and thousands of tons exported.

The accident experience of the reclaiming industry in the past has not been particularly good; whether due to unusually dangerous equipment, or to failure to keep pace with our friends in the safety movement, may be a question. However, let me call attention to some possible reasons. The largest reclaiming plant does not employ over 500 men and when compared with establishments of similar number of employees, in other industries, our experience is favorable. Again, some 40 H.P. of power is used per employee, an unusually large amount, indicating that the quantity of machinery per employee is large, naturally meaning increased hazard. Even then, most of our accidents, especially serious ones, are due to causes not peculiar to the industry, with the possible exception of burns and scalds, to which our processes render us particularly liable.

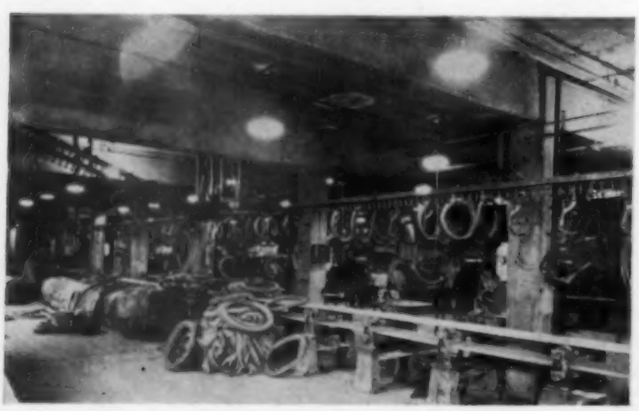
Conveying Equipment Present Hazards

Today, most reclaimed rubber is manufactured by the alkali process, though the acid process is also used to a considerable extent. Since the writer is less at home with it, however, this description will be chiefly of the former.

All reclaimers find it necessary to maintain a considerable supply of raw material, scrap tires, hose, air brake, boots and shoes, etc. Efficient and low cost handling from cars to stock pile, and from pile to processing, requires conveying equipment of some kind, usually one or more gantry cranes. Hazards exist here, both in pile and crane. We have known men to fall from the pile, or tires from the pile to fall on men below. It is surprising that more do not stumble while working on the piles, with consequent sprain or fracture. Where cranes operate on elevated runways, there is less danger, but with rails upon the ground, men have been caught and crushed. Others have been beneath when a loosely caught box or bale fell. In more than one instance, the crane has left the rails and toppled over, fortunately causing minor injuries.

Since reclaiming is basically a chemical process, and formulae are followed, it is necessary throughout to keep check on quantities, so, whether from car or pile, the first handling is that of weighing. Usually the scrap will be loaded on skids, or in boxes, delivered by crane to ground, picked up by an industrial truck, or hand lift truck, taken to scales, then on to pile, if to be stored, or to the next step, if going in to processing.

Note: This paper was presented before the National Safety Congress, Pittsburgh, Pa., September 30, 1930.



Conveying Equipment in Reclaiming Plants Often Presents Safety Hazards

Dangers in Removing Beads

This next step is usually that of removing the beads on tires. Sometimes done by hand, the man pulling a knife around as he revolves the tire on a table, it is more usually done by machine, a revolving circular knife, motor driven, separating the bead as the tire is revolved in the machine. Whatever type of equipment, there is the hazard of the knife, hands sometimes being caught and drawn in, usually with serious injuries.

Some machines are more automatic than others, the operator being in such a position that he cannot be caught. Others are fitted with safety devices, not greatly unlike those on the household washing machine wringer, the release of the operating pedal, or the striking of a safety trigger, opening and stopping the feed rolls, or bringing the machine to an abrupt stop through a plugging control on the motor.

The tire is then reduced to smaller pieces through the medium of one or the other of several types of machines; the chopper, or rag cutter, having knives on the surface of a revolving cylinder, cutting the tire into pieces the size of your hand; the hog, an adaptation from the lumber industry somewhat similar, but reducing to rather smaller pieces; or the cracker, a two-roll mill, the rolls being corrugated, which grind and tear the tire into pieces and strips.

In whatever manner this initial breakdown may be done, somewhat similar crackers are usually used for the final grinding, which produces particles passing through a 3/8" or 1/4" screen, the larger pieces falling back into the cracker for regrinding.

Caustic Soda Bath in Digesters

About two or three tons of this ground tires is then charged into steam-jacketed digesters, either horizontal or vertical, about 5' 0" in diameter and 18' 0" long. A solution of caustic soda, sodium hydroxide, is then added, the digester headed up, the agitating paddles inside started turning, and steam turned into the jacket. The charge is cooked in this manner for from 10 to 20 hours, during which the action of the caustic under heat and pressure, destroys and dissolves all cotton fibre, removes free sulfur and soluble compounds and swells or polymerizes and plasticizes the rubber.

At the conclusion of the run the contents are dumped into some arrangement for draining off the liquor, and applying water to wash away the caustic. A traveling screen is sometimes used for this, a vertical tank, with agitators and water spray, or a long vat

and their MANY SAFETY HAZARDS

Improving. Quantity of Machinery Per Employee is Large, Offering to Causes Not Necessarily Peculiar to the Reclaiming Industry

REGAL
Works Company, Akron, O.

with a partition along the center, around which the contents are circulated by agitating paddles, while water is added, then drained off.

Since tires frequently pick up nails, other metal and stones, it is customary to separate these out by pumping the washed stock over a "riffler," a long, inclined trough with frequent baffles, or dams, over which the water and lighter stock flow, leaving the heavier material sand, stones and metal, on the bottom behind the dams.

The stock may then go into large tanks where the rubber settles, the excess water being drained off. The stock next drops into screw presses, a machine which consists of a screw decreasing in pitch from receiving to discharge end, likewise usually tapering down in diameter, revolving in a cylinder either perforated, or made up of a series of bars forming slots, so that the cylinder walls are screens, through which the screw forces out the water in the stock, finally discharging the rubber at the small end.

Drying Processes

This is taken to driers, of which there are many forms, some using flat screens on which the rubber is placed, hot air being forced through from underneath, others, a continuous belt-like screen enclosed in a casing, the wet stock being fed on at one end, dry stock being delivered from the other, heated air passing through screen and stock. Still others use an oil, gas, or powdered coal-fired rotary drier, a long revolving cylinder, inclined somewhat from the horizontal, the stock being fed at the upper end, gradually working down past baffles and against the flow of hot air and gasses which enters at the bottom, to discharge at the lower end.

All this time, from the initial chopping or grinding, the stock has been in a granular form, capable of being shoveled like buckwheat coal or fine gravel, and flowing from conveyor, box or bin. When sufficient water is used with it, it can be pumped and will flow as would these substances. After being dried, however, it has a tendency to mat together.

Milling and Refining

The remaining stages of processing are located in the millroom, where the stock may go directly to refiners, or first to warming mills, usually about as large as rubber mills are made, with 26″ diameter by 84″ long rolls, the stock being repeatedly passed through the rolls until it becomes warm and coheres. Now in the form of spongy masses, it goes to the refiners. These are sturdy two-roll mills, the rolls being relatively short and large in diameter. Sizes vary according to the ideas of the reclaimer, one commonly used consisting of a 21″ and a 24″ diameter roll, with 32″ face. These rolls, of chilled cast iron, the alloys and steels are beginning to be used, are carefully ground and polished, and are set together so tightly that the rubber issues in a sheet whose thickness is measured in thousandths of an inch, .003 being common. These rolls are so geared that they do not travel at the same speed, the surface of one roll moving, say, twice that of the other. This ratio of surface speeds, called the friction ratio, varies according to the desires of the manufacturer.

The action taking place is a rubbing, almost a grinding, so that the pieces of stock, previously like grains of wheat or corn, become crushed and flattened and rubbed into each other so that the sheet coming out is as uniform and smooth as this sheet of paper.

Some manufacturers will repeat this refining, or even pass the stock through a third time. Either between these refinings, or following, the stock will go through a strainer similar to a tubing machine, 10″ in size or larger, having a perforated head instead of a die, which is lined with screen cloth of a satisfactory fineness to screen out the flakes of metal which may have escaped the magnetic separators, the washers and the rifflers.

The stock, leaving this machine in strings quite like macaroni, is dumped into a leaf-sheeter, for the final stage, issuing in laminated slabs. It is now ready for the market, requiring only weighing, packing or loading or transmission to storage.

Where scrap rubber is reclaimed by the acid process, much the same methods of reducing the scrap to small pieces will be employed but the stock will then be loaded into some form of open vat or else into towers. Such a vat might be rectangular, a convenient size being about 8′ 0″ wide, 3′ 0″ deep and 12′ 0″ to 18′ 0″ long. Or round, say 10′ 0″ diameter and 10′ 0″ high. A tower, probably rectangular, might be 6′ 0″ square and 15′ 0″ high.

Several thousand pounds of stock will be loaded into such a container, and sulphuric acid diluted with water to the desired strength applied either as a spray, where the tower is used, or as a bath, in the vat, the whole being kept at the desired temperature, 150° to 200° F., for from 24 to 72 hours. Washing, drying and milling is then carried on much as previously described.

Since dilute sulphuric acid attacks iron and brass, wood and concrete, lead is used as a lining for such containers, and washers must be of vitrified brick or tile, or similar construction, to withstand its action. Pumps and piping must also be of lead, or acid-resistant material.

From a safety standpoint, there is little to choose between acid and alkali, either causing severe burns unless promptly neutralized.

Many Hazards in Handling Bulk Scrap

It is apparent that conveyors of many descriptions play an important part in handling this large tonnage economically. Before the tires have been chopped, they may be handled by the chain type which carries hooks which automatically dump as previously set or the belt conveyor has a wide application, both here, and in later steps of the process.

Where stock, after being chopped, must be carried to a higher floor, the bucket elevator, or the inclined scraper, will be used. The

Straight Line Handling of Scrap in a Reclaiming Plant

spiral conveyor also has a wide field of successful application. A favorite method of handling stock after digesting, when naturally there is a superabundance of water, is with centrifugal pumps, an unusually economical and satisfactory arrangement.

Pneumatic conveyors, blowers, tubes and delivery cyclones, are much used as long as the ground stock is not too wet.

The handling of the material in process in boxes, wheeled tube, or on skid boards, either by gantry cranes, as referred to, by overhead monorails, either motored or hand propelled, or by industrial trucks, gasoline or battery powered, is common, expediency and low cost determining which form is employed. The battery lift truck is certainly a flexible piece of equipment, and in some of the many forms available, or adaptations, frequently will be found the most satisfactory method of handling many steps between processes.

We refer to certain inherent dangers associated with cranes and scrap piles. Conveying equipment of all kinds is a possible source of injury. We have known men to be caught by the suspenders or other parts of their clothing, by hooks on a chain conveyor, and carried considerable distances before the clothing gave way, or a fellow-worker shut the power off. Even the belt conveyor or the scraper, as well as the spiral, has caught the foot of a careless workman, due to someone's carelessnesss in displaying a cover.

Choppers and hogs sometimes throw with considerable force pieces of metal which may come through with stock, or break off in the machine itself, while occasionally, perhaps due to too large a piece of iron or of wood getting in, the machine may fly apart, the high momentum of the necessarily heavy revolving parts producing almost an explosive effect.

We have known men, cleaning out while the machine was running, which is forbidden, of course, to stick their fingers into the revolving knives. We had one man, an old employe, a shift foreman, for years on the job, lose a portion of a finger between the corrugated rolls of a cracker, while thoughtlessly pulling out a piece of scrap which had caught.

Digesters Offer Hazards

Steam heated digesters offer several potential hazards. In one case, before the application of a mechanical safety interlock, the door of a horizontal heater had not been properly fastened, and blew off when steam was turned on, impelling the heater body through a brick wall and a small wooden shed, to lie some 60 feet away, the door, after traveling about 20 feet, coming to rest against a column. The entire room was filled with scalding steam. Had this occurred 15 minutes earlier or later, loss of life and injury would have been heavy.

When a digester's run is over, in some plants, the steam is turned off the jacket, and the internal pressure is gradually reduced to atmospheric by opening valves connected to blow down piping. The head may then be removed, and the contents dumped. Sometimes the crew, unwilling to allow all of the prescribed time for this important procedure, will remove the head bolts, and loosen the head while there is still considerable pressure. The steam, issuing around the head has caught the men, bad scalds resulting, and death in some cases.

In some equipments the dump head is piped directly to a receiving tank and the opening of a valve allows the stock to be blown out under pressure.

It is self-evident that a man going inside a digester to clean or repair it, should assure himself that there is no danger of the paddles within being started. Yet that has happened, with narrow escape from injury.

These agitating paddles, revolving slowly, are usually driven through worm wheels. We have known these wheels to break, due to something going wrong, and fall to the floor, endangering whoever might be beneath.

Burns from Caustic Soda Are Frequent

Caustic soda must, of course, be handled carefully, and we have frequent first aid stations, with neutralizing solutions. Although boots, aprons, gloves and goggles are worn, we still have burns, though seldom serious.

Stock, after being pressed quite free from water, is elevated to bins above the driers, by bucket elevators outdoors. In cold weather, to keep the boots from freezing, a jet of steam is turned inside the boot, a drain connection carrying off whatever water they may be. During the week-end shutdown, these boots, as is all similar equipment, are thoroughly cleaned of any accumulation of stock. Though cautioned about checking the closing of steam valve, and the drain, one poor fellow, working on a ladder, opened a hand hole above his head, and since it happened the drain had clogged, received a quantity of hot water on his back, dying from the resultant scald.

In plants where there are ramps or raised platforms, there is always danger of industrial truck wheels slipping over the edge, upsetting the truck, or pinning the operator against wall or column, or, perhaps, freight car side. Or, the pedals may be run into wall or column, skid or box, catching an unwary operator's foot, if it overhangs. The steering handle may in like manner catch his hand. To prevent such injuries, a guard rail may be installed along the edge of ramp or platform, a rigid fender frame around the pedals, and a sabre guard on the steering handle, or perhaps a disc on the end, may prove effective. Doorways and corners, where a pedestrian may be caught by a swiftly moving truck, must have signs calling attention to the hazard, inclined mirrors giving a view of what is approaching, or drivers must be thoroughly schooled to give warning of their coming.

Electrical Hazards

Electrical hazards not always sufficiently recognized exist in every reclaiming plant. One hundred and ten volts has proven fatal so frequently that it is realized to be a dangerous voltage, yet almost without exception lighting circuits are the customary 220/110 volt three wire system. A digester cannot be charged, dumped, washed, cleaned or repaired without the use of an extension cord, and in cleaning and repairing, the workman is inside. In any event, he is standing on, or in contact with, the perfectly grounded iron of the machine, usually wet, or he is standing in water. Broken down insulation on his extension cord, or coming in contact with a live part of the lamp or socket, provides every opportunity for a fatal shock, which has happened before in our industry, and will happen again. The same condition exists in boiler-cleaning, in fact wherever extensions are used where floors or men are wet.

A scheme which has been successfully applied, and which is highly recommended, is that of supplying the extension circuits from a transformer the secondary of which, not connected with the primary, is 110/55 volts, the 55 volt tap, or middle point, being thoroughly grounded. Standard 110 volt lamps, and other equipment such as fans or portable tools, can thus be used, but the highest voltage to ground is 55, recognized everywhere as not dangerous. So, even should the code regulations providing for grounded socket shell be disregarded, through careless work on the part of electricians, the man is safe.

It is taken too much for granted even today that a reclaiming plant, because much steam and water are used, must be sloppy. We know that such processes can be kept clean, and equipment so arranged that hazard is reduced to the minimum. Light, in such locations, is a valuable aid to safety. Cleanliness and order, throughout, are so tied in with good management and efficiency, that it would seem unnecessary to particularly demonstrate how intimately they are connected with safe operation and low cost production. Yet there is many an earnest foreman who fails to realize this relationship until the safety engineer or superintendent has convinced him by object lessons or data. We do not believe any one theme can better be continuously, persistently, hammered on than this, "cleanliness and order."

All in all, the hazards in the reclaiming plant differ little from those in rubber goods manufacturing plants, and success in safety work with us depends upon carrying out the same methods which have reduced accidents in such factories. We must constantly check our equipment, to see that guards are not laid aside. We must constantly watch for that unappreciated accident opportunity, to rectify it before the accident occurs.

Rubber on Miniature Golf Courses

THE miniature golf craze, which has so recently developed to an astounding extent, has suddenly opened up several new avenues for entirely new uses for rubber.

Green sponge rubber has become an excellent substitute for turf, and as it may be laid perfectly flat or on a slope, or stretched over obstacles forming hummocks, the course may be laid out in numerous ways, to add to the game's enjoyment and its hazards. The surrounds to the course may be made of billiard cushion rubber, giving additional rebound to the ball at unexpected places. Hazards of many descriptions made of rubber may also be used.

CRYSTALLIZED RUBBER

Uncle Sam's Laboratory Makes One of the Most Interesting Discoveries in the Realm of Rubber Research

By RALPH F. WOLF

RUBBER—that mysterious substance which has baffled chemists as long as its existence has been known—is slowly yielding up its secret under the probing eyes of scientists at the United States Bureau of Standards in Washington.

Since the day, nearly a century ago, when Charles Goodyear in a Connecticut kitchen vulcanized rubber for the first time, the plastic substance has remained an unknown quantity. Although rubber is the foundation of one of the country's greatest industries, its technologists have never known the true identity of the material with which they have worked.

Within the next year, Dr. W. H. Smith, of the staff of the Bureau of Standards, at Washington, D. C., expects to announce the true formula of rubber and the structure of the rubber molecule—two facts which long have eluded chemists.

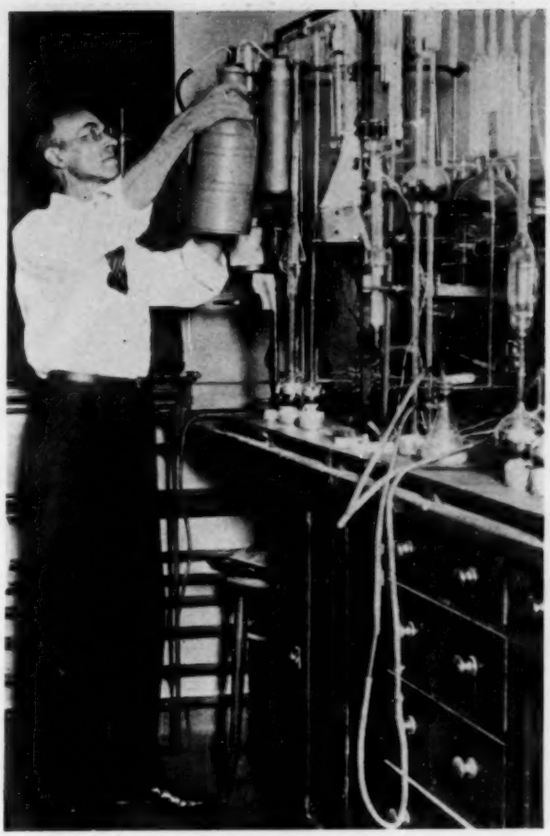
When this information is obtained, Dr. Smith believes he will be in a position to make the first real attack on the question of the synthesis of rubber.

Rubber Crystallized for the First Time from Highly Purified Ether-Sol. The High Degree of Purification Is Shown by the Ease With Which the Type Can Be Read Through a Layer 1" in Thickness

The government scientist recently crystallized rubber for the first time. Until this feat was accomplished, rubber was always regarded as a member of the large class of bodies known as colloids—nondescript substances on the borderline between solids and liquids.

Crystalline rubber consists of small, transparent plates as clear as the best glass. The individual crystals have been photographed under powerful microscopes by the use of polarized light. The exact shape of the crystals has not yet been determined.

The crystallization of rubber was achieved only after tedious experimentation by Dr. Smith. Briefly, the process consisted of getting the rubber into a fluid condition so that the molecules could move about freely and arrange themselves in geometrical patterns; purifying the liquid to rid the rubber of all foreign proteins; and increasing the crystalline forces in the substance by lowering the temperature.



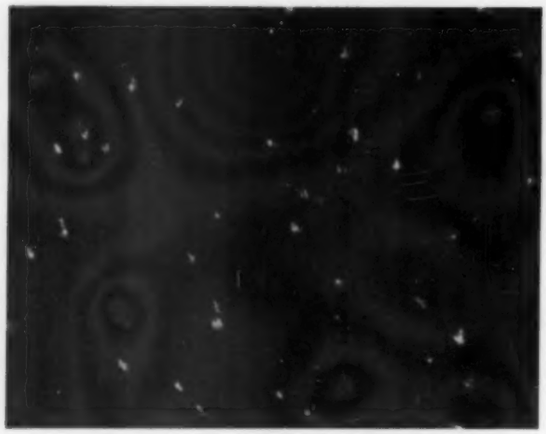
Dr. W. H. Smith, of the U. S. Bureau of Standards, Carrying Through Some of His Experiments in Crystallizing Rubber—One of the Most Important Steps Yet Taken in Rubber Research

Crude and refined rubber is known to consist principally of hydrocarbons mixed with smaller quantities of various protein impurities which can only be removed by a lengthy operation. Dr. Smith has not revealed the exact methods which he used to purify the crude product, but he finally did obtain a clear, colorless, transparent, elastic solid—as clear and colorless, in fact, as the best plate glass. Printed matter is as easiy read through an ether-sol of this rubber as through a clear lens.

The problem of determining the composition of this highly purified rubber has heretofore been difficult because of the fact that two of the most useful processes ordinarily employed by the chemist, namely, crystallization and distillation, could not be applied to the material. Both of these processes have now been recently developed at the Bureau of Standards.

The first step in obtaining the crystals is to dissolve the purified rubber in ether. The dilute solution is cooled and when the temperature reaches 80° Centigrade, the microscopic plates begin to appear. As the process continues the plates gather in larger and larger clusters until they are visible to the unaided eye. As soon as the temperature rises, the crystals melt back into their original form.

The synthetic resin and plastic industries need have no fear of a new competitor, inasmuch as crystallized rubber can not exist at ordinary temperatures. Early newspaper reports of Dr. Smith's discovery declared that he had pro-



A Photograph of Rubber Crystals Taken Under Polarized Light Showing Birefringence. The Crystals Were Photographed Under a Magnification of 120 Diameters. The First Photograph of Crystallized Rubber

duced a metal-like solid which threatened the older molded material industries. These reports were unfounded.

Dr. Smith intends to recrystallize his purified ether-sol rubber many times, repeating the cooling and melting process over and over, until he is sure he at last has crystals of pure rubber and nothing else. Then he will undertake a combustion analysis to determine the exact proportions of carbon and hydrogen. After molecular weight determinations have been made, Dr. Smith believes he will be in a position to announce the exact formula of rubber.

Experiments Upset Previous Beliefs

It has long been thought that rubber represented a polymeric modification of isoprene, from the occurrence of the latter among the products of the destructive distillation of rubber. Smith's preliminary analyses indicate that the unknown formula does not correspond with the formula C_5H_8 which has so long been accepted as the probable formula of rubber. Either the formula is not C_5H_8 or else rubber consists of a mixture of more than one hydrocarbon, according to the latest analyses.

"The process recently developed at the Bureau by which pure rubber can be repeatedly crystallized opens the possibility of successfully fractionating it into its constituent hydrocarbons and eventually of determining the formulas of their molecules," says Dr. E. W. Washburn, who has been associated with Dr. Smith in these experiments. "Once we have determined the formula of the molecules, the possibility of successfully synthesizing these hydrocarbons is increased at least to the extent that we know exactly what we are striving for. Furthermore, there is always the possibility that the pure hydrocarbon may have new and useful properties."

The Bureau scientists are skeptical about all of the synthetic rubbers which have so far been produced. Dr. Smith includes in this category a sample recently received at the Bureau purporting to have been made from California petroleum. Although he himself plans an attack on the problem, Dr. Washburn believes that it will be many years before any chemical process can be developed for the synthetic production of a rubber which will be able to compete with the natural product in price. In his opinion, time and money could be more profitably spent in attempts to develop plantations of rubber trees or similar latex producing shrubs in the southern part of the United States.

Dr. Smith and his assistants have also recently succeeded in distilling rubber for the first time without decomposition. The process can be successfully carried out by heating the purified rubber in a high vacuum to the temperature of boiling water and cooling the distillate at the temperature of ice water. This distilled rubber possesses all of the common characteristics of ordinary rubber, but the rate of distillation is not sufficiently great to make the process of much value for the purifying of rubber on a commercial scale.

Will Continue Experiments on Distillization

Due to the extremely small vapor pressure of the substance, only a few milligrams of rubber were condensed after the distillation had been carried on for four months.

The process has a definite scientific value, however, as it can be used for obtaining small samples of distilled rubber. Investigators will run combustion analyses of the distilled rubber as a check on the formula obtained in the rubber crystal experiments.

The 1929 Safety Record *in the* Rubber Industry

THE Rubber Section of the National Safety Council, for the years 1927, 1928 and 1929, has shown a steady decrease in frequency rate of accidents and at the same time a steady increase in severity rate. This picture is the same as presented by the total of all industries reporting to the Council. The following figures are quite interesting:

	Rubber Section		All Industries	
	Frequency	*Severity*	*Frequency*	*Severity*
1927	30.84	1.00	25.85	1.92
1928	24.95	1.17	23.39	1.97
1929	20.15	1.29	22.90	2.02

The Rubber Section may well feel proud of the reduction made in frequency which amounts to 35% in 1929 over 1927 while the reduction in all industry was 11% for the same period.

The showing on the severity rate, however, is not so good, the increase in the Rubber Section being 29% while all industry increased only 5%. An analysis of the 29% increase shows that it occurred in all three classes of time losses, i. e., fatalities, permanent partial disabilities and time lost from temporary total disability.

Fatal accidents in the rubber industry numbered one to every 5183 employees compared with one to every 1888 in industry as a whole. There was one permannet partial disability accident to every 937 employees which compares with one to every 430 in all industry.

The frequency rate in the rubber industry also compares favorably with indusry as a whole. The frequency rate of all industries for 1929 was 25.53 and the rubber industry 19.25 or 24% below the general average which places the rubber industry ninth in the 27 industrial groups listed in "Industrial Accident Statistics."

The records of individual plants showed a wide range of variation as did the grouping into large and small plants. In this connection it may be of interest to quote two very similar records turned in from a large plant and a comparatively small one. During the month of June, the tire division of the B. F. Goodrich Company worked a total of 750,000 hours without a single lost time accident. The Corduroy Tire Company are to be congratulated on equalling this record by working 697,183 hours from Sept. 13, 1929, to Sept. 13, 1930, without a lost time accident. These two records make it quite plain that regardless of the size of the plant a real safety minded organization can put safety across when they really try.

Rubber Chemists Hold First Group Meetings of 1930-31 Season

Guayule is Subject at Los Angeles—Chicago Discusses Liquid Latex—Boston Hears New Applications of Vulcanized Latex—New York Listens to Somerville's Talk on Russia

THE various local groups of the Rubber Division, A. C. S., have been especially active during the month. The Boston and New York groups held meetings this week, on the 22nd and 23rd, respectively. Chicago members met on October 3. The same evening the Los Angeles group were in session. The meeting of the Akron group is scheduled for October 27. All the meetings were well attended and the program of papers presented represents a wide range of interesting subjects.

Los Angeles Group

The meeting of the Los Angeles group, at which Dr. David Spence, of the Continental Rubber Company, spoke on "The Production of Rubber from the Guayule Plant," has already been reported in the October 10 issue of THE RUBBER AGE.

Chicago Group

The Chicago group meeting, the first of the 1930-31 season, was held in the Auditorium Hotel. Paul Van Cleef, president of the Chicago Chemists Club, gave an informal talk on his recent visit to the German rubber meeting at Frankfort, Germany. After Mr. Van Cleef's interesting report, a paper was presented by M. C. Teague, sales manager of Dispersions, Inc., on "Liquid Latex." During the reading of the paper, numerous samples of materials treated with liquid latex were passed through the audience and the process of treating these materials was described. Mr. Teague showed that the use of rubber today is not confined to the ordinary mechanical goods and tires as in the past, but that rubber can be used in practically every industry.

Following the presentation of the paper, the discussion started and after one hour and a half the speaker had answered questions from almost every person present. The meeting was a pronounced success, not only from the standpoint of attendance but from the interest displayed from those present.

Because of the numerous changes made in the industry since the spring meeting of the Chicago group many notices are being returned to the secretary. Those who are not receiving notices of the Chicago group meetings are requested to send their name and address to the secretary, B. W. Lewis, care of Wishnick-Tumpeer, Inc., 365 E. Illinois street, Chicago, Illinois.

Boston Group

The Boston group held its meeting on October 22, at the University Club. Over 280 members and their guests were present. The evening's program featured two interesting addresses. J. J. Skelly, general manager of the Charles E. Bedaux Company, spoke on "Labor Control" and Dr. Ellwood B. Spear, of the Vultex Corp., Cambridge, Mass., described "Some Practical Applications of Cured Latex." Brief abstracts of the papers appear below.

The addresses were preceded by an excellent dinner and a business meeting at which time officers for the ensuing year were elected and the report of the secretary and treasurer, T. M. Knowland, was read, showing that the group had a membership of 154 and a balance in the treasury of $195. The new officers chosen were as follows: George H. Rockwell, vice-president of the Cambridge Rubber Company, chairman, succeeding John M. Bierer; T. M. Knowland, Boston Woven Hose and Rubber Company, secretary-treasurer, succeeding himself.

Before the regular scheduled papers were read, the members heard from Everett Morss, president of Simplex Wire and Cable Company, who talked in glowing fashion on his cruise, early this year, to South America. He described the trip through the Panama Canal and the countries visited on the west and east coasts to and from New York. He was greatly attracted by the progressiveness, size and beauty of a number of the cities on both coasts and was particularly impressed by the trip through the Straits of Magellan.

ABSTRACTS

LABOR CONTROL. *J. J. Skelly.*

A real method of labor control should furnish a basis for determining abnormally high costs and a means of reducing them, at the same time providing an incentive to labor to increase its efficiency and earning power. The function of a system of labor control is the accumulation and recording of pertinent information in such form that control can be exercised over the utilization of labor, service, material and equipment. The use of a unit in measuring labor shows whether or not labor is producing up to a standard requirement. It also allows intelligent comparisons to be made between operators, between departments, and even between plants, regardless of the variety of products turned out or the difference in scales of wages. The Bedaux system of establishing standard units for workers in industrial plants was discussed and its application to rubber factories.

SOME PRACTICAL APPLICATIONS OF CURED LATEX. *Dr. Ellwood B. Spear.*

There is almost no difference between cured and uncured latex visible to the naked eye, but the addition of chloroform causes the cured latex to become a rubbery mass with no coherence while the uncured latex forms a mass of considerable consistency. The cured latex, known as Vultex, has a tensile ranging up to 5000 pounds while uncured latex seldom shows more than 1800 pounds. The application of Vultex has been found to be of particular value in the impregnation of fabrics for giving waterproofing properties, to prevent unravelling of warp and filler threads and to improve the wear. Fabrics can be treated by running through a bath of Vultex, then squeezing the excess latex out by means of rolls, passing through a tentering machine and finally drying. The advantages of this method of preparation over the usual methods are that there

is no fire hazard, no curing necessary and little machinery is required.

Other uses of cured latex described were as follows: (1) for locking piles of pile fabrics, such as rugs, automobile fabrics, etc., (2) hospital sheeting, (3) making imitation leather by impregnating both sides of the fabrics, then coating and graining one surface, (4) for miniature golf course surfaces, using a specially prepared pile fabric, (5) surgeon's gloves, which stand up to 15 sterilizations, (6) ink sacs for fountain pens, (7) surgeon's sheeting, (8) toy balloons, (9) rug bottoms to prevent slipping on smooth floors.

New York Group

The New York group meeting, held on the evening of October 23, in the Silver Grill Room of the Lexington Hotel, was also well attended and the papers were enthusiastically received. The program included three addresses and musical entertainment was furnished by an orchestra and a very excellent quartet from the Underwriter's Laboratories. Over 150 members and guests were present.

The papers presented included a talk by H. A. Depew, New Jersey Zinc Company, Palmerton, Pa., on "Accelerated Discoloration Tests for White Rubber Products and Methods for Measuring Extent of Discoloration"; a paper by H. G. Bimmerman, E. I. duPont de Nemours and Company, Wilmington, Del., on "Control of Uniformity of Press Cures," and an informal address by A. A. Somerville, of R. T. Vanderbilt Company on his various impressions gained during his recent trip to Soviet Russia. Brief abstracts of these papers appear below.

ABSTRACTS

IMPRESSIONS OF SOVIET RUSSIA. *A. A. Somerville.*

He described the industrial, labor, food, hotel and transportation conditions in Russia as well as his visits to three rubber factories in Moscow and Leningrad. Six interesting slides illustrated the talk. One of these showed the airplane routes over Europe, including the trip Dr. Somerville took by plane from Leningrad to Berlin, a distance of 1400 miles in 13 hours, made in five relays, using a different plane each time. Another interesting slide was a colored map of Russia showing the industrial products and natural resources of the country and their location. The most amusing of the slides was that of a burlesque of Dr. Somerville's conception of the Russian situation. The other slides include maps and pictures taken on the trip.

ACCELERATED DISCOLORATION TESTS FOR WHITE RUBBER PRODUCTS AND METHODS OF MEASURING THE EXTENT OF THE DISCOLORATION. *Harlan A. Depew.*

The sensation of color is caused by the action on the eye of a band of wave lengths that may be considered as narrow when compared with the entire field of radiation. To measure the color of a surface, it is necessary to determine the curve for the amount of light reflected over the visible range of wave lengths from about 4000°A to 7700°A. To simplify the tabulation of data and the comparison of results in the case of white surfaces, an average brightness figure and another value known as saturation can be used. The brightness in the green can be used for the average brightness. Saturation refers to the purity of a color sensation and an approximate value can be obtained for yellow saturation by a simple calculation.

Color only involves the wave range from about 4000 to 7700°A but discoloration is mostly caused by shorter wave lengths, especially those given off in sunlight which range from 4000 down to about 2900°A. The amount of yellowing is dependent on weather conditions (rain and temperature) during exposure in addition to the amount and wave length of the discoloring light.

The mercury arc lamp gives light entirely different from sunlight but the discoloration shows fair correlation in many cases.

The relative action of pigments in preventing discoloration may be in part chemical but it is also in large part physical. Opacity of pigments to the yellowing wave lengths limits the depth of penetration of the light and, therefore, the amount of yellow formed. The whitening strength of the pigment then acts in overcoming the yellow formed.

CONTROL OF UNIFORMITY OF PRESS CURES. *H. G. Bimmerman.*

Important points in the setting up and operating of hydraulic presses for laboratory work are noted. Dry steam, properly trapped pipes, drained platens and careful insulation and shieldings are necessary for accurate work. Points requiring special consideration in order to avoid pitfalls are covered. Instruments for maintaining constant temperatures are discussed as to methods of installation and operation with special emphasis on ease of operation and accurate control. A comparison is drawn between thermometers and thermocouples for checking temperature, enabling one to choose the instrument best suited for the type of work being investigated.

The three most important points to be checked in the setting up of presses are circulation, insulation and the correct type of regulators.

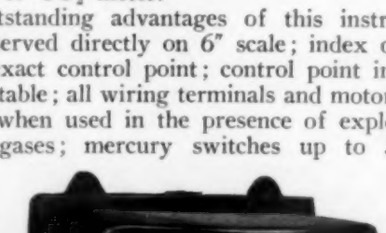
Akron Group

The Akron group are holding their meeting at the Hotel Goodyear on the evening of October 27, and a very interesting program is scheduled. After dinner Professor F. E. Lloyd, of McGill University, will give a talk on "Sources and Cultivation of Rubber" and will be illustrated by pictures taken by Professor Lloyd himself. In the printed announcement of the meeting it is stated that Professor Lloyd "knows his latex" and an especially interesting talk is anticipated. Enthusiasm over the meeting is running high and an attendance of 250 members and guests is expected.

New Brown Automatic Control Indicator

A NEW type of automatic control indicator is being offered by the Brown Instrument Company, Philadelphia, Pa. The instrument, known as the Brown Model 801 Indicating Pyrometer Controller can be supplied as an automatic control pyrometer, resistance thermometer, tachometer or CO_2 meter.

The outstanding advantages of this instrument are: reading observed directly on 6" scale; index on scale for setting to exact control point; control point instantly and easily adjustable; all wiring terminals and motor enclosed—no danger when used in the presence of explosive or inflammable gases; mercury switches up to 30 amperes



Brown Indicating Pyrometer Controller

capacity, eliminating the necessity of relay equipment—make and break occurs in sealed glass tube—no danger of spark causing explosion; suitable for "on and off" or "three position" control through switches, valves, dampers, etc.; available with patented safety device which opens furnace circuit if thermocouple or wiring fails, preventing burning out furnace; high internal resistance, insuring accuracy; automatic internal compensation eliminating cold junction errors when instrument is supplied as a pyrometer; simplicity and ruggedness insures minimum of attention.

The control mechanism of model 801 indicating pyrometer controller combines the basic principle of the Brown automatic control recorder with the new feature of mercury contacts for breaking high currents.

Rubberdom's Stake in the New Design Copyright Program

Bill Already Passed by House of Representatives and Now Before the Senate Will Protect Novelty Designs of Rubber Goods and Other Manufacturers

By WALDON FAWCETT

WHEN relief from a difficult or intolerable condition in business is proportionate to the need there is cause for rejoicing. Accordingly is there cause for satisfaction in rubber manufacturing circles over the news that the Committee on Patents of the United States Senate this winter will take the next step in a legislative program destined to provide more suitable and more simple protection for original designs in industry. The United States House of Representatives has already acted favorably. It only remains for the upper house of Congress to concur in recognition of the broader basis of monopoly rights in this all-important species of "industrial property."

The nation's present inadequate and unwieldy system of safeguarding ornamental designs applied to articles of manufacture has long been a thorn in the side of the producer of rubber goods who relies for saleability on novelty in shape, form, outline, pattern, or surface decoration. Lack of suitable Federal insurance for creative designs, for years has cast a chill upon the spirit of experimentation and progress in design. Deprived of assurance of the rewards that ingenuity in modeling and styling should command, many producers of rubber goods have hesitated to make the capital outlay involved in the creation, fabrication and marketing of new departures in design.

Congressman A. H. Vestal, of Indiana, Sponsor of the Design Copyright Bill

Rubberdom's ambition for pioneering in design has been sapped, not so much by deficiency in the amount of protection available, as by the character of the protection. The available shelter against imitation or infringement of design has been found in a branch of the United States patent system devoted to "design patents." The design patent covers the appearance of an article of manufacture, in contrast to the mechanical patent which covers the function and operations of a working mechanism, and in further contrast to the process patent which covers the method of fabrication. The routine of censorship for designs at the United States Patent Office at Washington is much the same as for the subject matter of mechanical patents. When a grant is made, however, a design patent is obtainable at graduated fees for periods of 3½, 7 and 14 years at the option of the applicant.

Manufacturers of rubber goods have had two major quarrels with this design patent system which has defied all efforts for reform for so many years. The first grievance is found in the amount of official red tape encountered in the patenting operation and the consequent lapse of time that ensues ere a patent may be obtained. Rubber firms, manufacturing for seasonal needs and transient taste, have repeatedly had the experience of seeing a fashion-made market grow stale under their eyes before they could obtain a patent on a unique design and go into production with confidence that they could control the market for a novelty. Indeed, the rise of that form of design piracy which steals promising designs between the pre-showing to the trade and the issuance of patents, is due mainly to the tragedy that it requires anywhere from several months to a year to obtain a design patent.

The other deep-seated grudge which the trail-blazers of rubberdom hold against our inelastic design patent system strikes at the very fundamental of the system, i. e., the requirement of a showing of "invention." Without wholly subscribing to the adage to the effect that there is "nothing new under the sun," even the most resourceful of producers have come to realize that absolute originality — the radical departure from all precedent — is a rare accomplishment in designing. Usually, what pass with the trade and with the public for new and "different" designs are rearrangements of elements old in the art. The ensemble effect is fresh and distinctive, but it may be obtained, and with no shame to its author, by a variation in the treatment of a recognized motif in design, a revolutionary employment of color, or an unheard of arrangement of design details that are severally familiar to most beholders.

This conception of originality in the "authorship" of a design is deemed sufficient by the majority of rubber manufacturers for the protection of their conceits in set-up. It is the basis of protection which prevails in the main copyright system of the nation, covering the fine arts and intellectual productions. But, woe to hope of such leniency under the design patents system. The arbiters at the United States Patent Office, supported for the most part by the Federal courts, have been wont to insist that a design, in order to be patentable under the stern statute, must show "invention." In effect, it must approximate a stroke of genius—a flash of inspiration in the mind; not mere

dexterity of the hand. This rigid exaction has closed the doors of protection to innumerable rubber items that are sufficiently unusual in appearance to pass muster with all laymen as special exclusive patterns.

Would-be reformers realized from the outset that it was too much to hope that the patent system could be disrupted to accommodate the modern, rational idea of originality in design. As an alternative, came the suggestion that design protection be lifted from the patent institution and transferred to the Federal copyright system, with which latter it is much more in sympathy. That is the plot that is now afoot. The design annex of the patent system would be abolished entirely. In its stead, machinery for the certification of property rights in original designs would be added to the United States Copyright Office at the Library of Congress, which already serves as a clearing house for copyrights, other than the copyrights on labels and advertising prints for articles of manufacture. To put the proposition in a nutshell, design protection would be shifted from the patent system to the copyright system.

Vestal Bill Has Had Hard Road

A bill, commonly known as the Vestal Bill, to accomplish this object has been on the waiting list at the United States Capitol for several years past, undergoing the while, the shaking-down operation which is the common fate of all special legislative programs of this kind. No little negotiation in Congressional committee has been necessary to reconcile conflicts of interest. First of all, the manufacturers of spare parts or repair parts, so called, had to be appeased with an amendment inserted to prevent the manufacturer of "genuine parts" from monopolizing replacement business. The apparel industries and other dependents upon style trends for design dictation must needs be guaranteed that design monopolies shall not transgress the common rights of fashion observance. Finally, retail merchants in various lines voiced apprehension lest they become liable for penalties for the innocent distribution of designs, unrecognized by them as infringements.

With the controversial atmosphere pretty well cleared during the early part of 1930, the Design Registration Bill passed the House of Representatives shortly before the adjournment of the last session of the 71st Congress. Inasmuch as the House Committee, which reported favorably, had disposed of the public hearings and other time-consuming preliminaries, it is possible that the measure may be handled with expedition in the Senate, once it has place on the calendar. By and large, the situation with respect to design protection is almost identical with that of trade mark revision. Sooner or later, Congress will accept the compromise draft which has been worked out in cooperation by all the industries that are dependent upon this class of "intangible assets."

Simplicity of Securing Design Copyright

Examination in detail shows more clearly the gains which the rubber industry will make by exchange of design patent for design copyright. The saving of time is crucial. A few weeks should suffice to complete the average copyright entry, whereas the months may run into a year or two if there is any hitch in the issuance of a design patent. Speeding up is possible because, in the case of design copyright, Uncle Sam will not undertake to search the records to make sure that no earlier comer has anticipated an applicant in the use of a given design idea. What Uncle Sam would do, under design copyright, is to issue a certificate testifying to the date on which an entrant conceived and began the use in manufacture of the design claimed as original. If a second party challenges the right of a copyright owner, the Government will leave the two to fight it out in the courts. Only, by virtue of the copyright status, they may wage the contest in the Federal courts.

Alongside in importance to the saving of precious time the proposed legislation will afford a saving in money to the applicant. A nominal entrance fee will secure for a designer or design owner a copyright franchise that will safeguard his rights while he tries out the market for his novelty. So simple the procedure under copyright that a rubber manufacturer may stake his design claims from his own office without calling for the aid of an attorney. Thus the total outlay for the average design copyright should be no more than nominal as compared with the expense, usually running from $50 to $100 at a minimum, incurred in obtaining a design patent.

Means Copyright Protection at Low Cost

The saving in the first expense of design copyright should enable many rubber manufacturers to take an extra precaution which, by reason of prohibitive cost, has heretofore been out of reach of most of the members of the industry that have patented their designs. Ever since design piracy reached its present proportions, the worst pest of the creative manufacturer has been the copy-cat who near-mimicks a popular protected design. That is to say, the irritation comes of the border-line borrower of ideas who puts forward a partial-counterfeit design—a "shadow" just far enough from its inspiration to put it beyond reach of indictment as an infringement, yet near enough in some of its features to confuse purchasers who buy in response to general impressions and without analysis.

Under the conditions that now obtain, the only chance for a rubber manufacturer who desires to completely fence off his capture of a striking basic design is to take out a patent on each variant or separate version of the design. At the prevailing prices, this inclusive game is seldom worth the candle, even if the manufacturer be not deterred by the time required for multiple patenting. If design copyright was in force, with its low overhead, many firms that are keen to keep their lines exclusive, would doubtless copyright, not the lone designs that were chosen as leaders, but also all the various alternatives. The blanket protection thus obtained would leave the copyright owner free to ultimately concentrate on whatever version of the design manifested the greatest selling power. More to the point, the monopolist could manufacture under only one design, yet hold away from trailing competitors the modifications of that design which might, in the guise of cut-price substitutes, demoralize his market.

Congressmen have been told by more or less disinterested authorities that the provision of design copyright will do much to recruit in the United States a body of expert designers for industry who will do for the cause of manufacture here what the French designers have done for industry in France. In short, the argument is that superiority in design is capable of lifting American products above competition abroad as well as at home. Another prediction made at Washington is that, given better security against infringement, original designs may be expected to play an influential part in the fight between manufacturers' brands and private brands. Not a few manufacturers are rooting for design copyright in the faith that it will give them the coveted support, so often denied at the Patent Office, for alleged equities in improvised color schemes expressed in articles of manufacture.

Extra copies of the Index to Volume 27 of THE RUBBER AGE may be secured upon request. It was printed as Section II of the issue of October 10, 1930.

Eliminating Vibration *in* High Speeded Machinery *with* Rubber Foundations

By GEORGE RICE

A CONCRETE slab on a rubber foundation, similar to the plan shown in Figure 1, makes a flooring for high speeded machinery that will greatly reduce and often eliminate the vibrations usually accompanying heavy machinery. It is the weight of the concrete and the machine combined, resting upon a firm substance which in turn rests upon an elastic substance, that brings about a condition that absorbs the vibrations usually accompany machinery, which is operated on ordinary wood floors or cement structures, devoid of a material capable of softening the mechanical tremors caused by revolving gears, wheels and related moving parts.

The combination concrete and rubber foundations for machinery are used in two ways. Sometimes individual footings are employed, consisting of a separate block of concrete for each supporting foot of the frame of the machine, and these blocks are placed upon a rubber foundation of sufficient thickness to assure an elastic tread for these feet, which in turn are fastened to the concrete with lag screws. A second plan for constructing this type of foundation consists in employing a single concrete slab of sufficient surface area to accommodate the entire frame of the machine which is to rest upon it. Combination concrete and rubber foundations of this kind are constructed according to the plan shown in the sectional view when used on an upper floor. But when used on a ground floor, the wooden structure is not required as the first layer of concrete is made by pouring the concrete mixture into a properly excavated section in the earth.

Much more heavy machinery is operated on the upper floors of factories than formerly, with the result that the demand for foundations that will reduce vibrations to a minimum are sought. We found foundations of many descriptions in a recent tour of industrial plants, some of which consisted of cork board with a cement top. Heavy wool felt board, and board made up of textile flocks cemented in an intact form with a plastic substance were seen. All have their merits and demerits. And the architectural construction for most of them is well engineered. Among those of a rubber type giving the most efficient service were those of a sort of superstructure design, involving the building of a subsidiary floor above the main floor so as to receive the foundation for the machine. The subsidiary floor consists of another floor raised to the height of the proposed cement and rubber foundation of the machine. The concrete, which is made up of 1 part Portland cement, 2½ parts sand and 3 parts gravel, is poured in upon the main floor to the depth necessary to make a substantial base slap for the weight of the machine to be supported. Then a thickness of rubber is poured which also is gauged in depth, firmness and elasticity to conform to the dimensions, and pressure of the machine. The rubber layer cannot be too spongy, nor too hard to produce satisfactory results and reduce vibrations to a minimum. The bulk, weight and general mechanical lines of the machine to be supported have to be estimated as well as its speed, for the greater the number of revolutions its shafting makes, the more intensive are the vibrations.

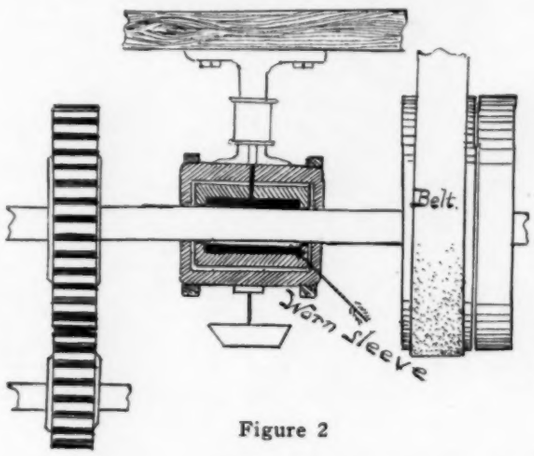


Figure 2

Vibration in a driven unit frequently is caused by a mechanical defect in the driving unit, such as a worn bearing sleeve in a shafting hanger

Figure 1

Sectional View of a Rubber Foundation Laid Between Concrete Slabs and Designed to Eliminate the Vibration of Any Machine Placed Upon It

The rubber layer is then topped off with the concrete slap on which the machine will stand, thus completing the foundation.

The advantage of using rubber for this purpose is that it does not pack down after a few years serv-

ice like some of the substances which are used for this purpose in manufacturing plants in which it is desired to eliminate excessive vibrations in the machinery on account of the noise or because the increased wear on the parts necessarily resulting when a machine does not run smoothly. Cork often is used between two layers of concrete or wood to soften down the vibrations of machinery, but cork tends to crumble and pack in time and consequently lose its resilliency. In one case that came to our notice, the heavy machinery of a garment dyeing plant was placed on cement footings that rested upon thicknesses of firmly set kopak, for the purpose of decreasing the noises created by the vibratory behavior of the moving parts. The other tenants in the building had complained about the unwanted sounds of the grinding bearings and grating gears. So long as the elasticity of the kopak lasted, the sounds were muffled. As soon as it dampened and matted, its resilliency ceased and the racket resulting from machine vibrations began again.

Other cases which have been brought to our attention within recent times demonstrate that the machine itself will not be far from the junking stage by the time the rubber foundation which has been laid to reduce vibrations begins to succumb. In fact we have not yet found any foundations of this class which have failed because of cracking, hardening or softening, except in cases where the wrong kind of rubber mixture was used, or a defective supporting foundation was laid for the rubber spread.

If the density of the rubber is too thin, or if it is not laid thick enough to withstand the weight of the machine, its effectiveness will be lowered and may be rendered practically nil. If too plastic in its nature, or if spread to a greater depth than required to give reasonable stability to the machine which is to be supported, there will be a tendency for the machine to rock, particularly if the machine is of light construction. Reclaimed rubber of good grade commonly is used and will give good service under normal conditions, but when employed to eliminate the vibrations

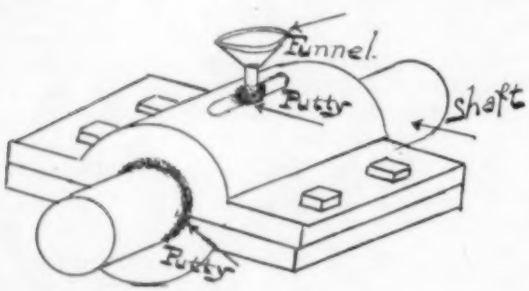


Figure 3

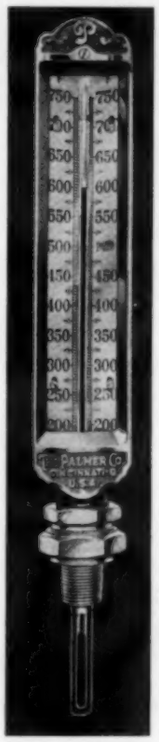
A worn or scored machine bearing will cause machine vibration until the defect is corrected by rebabbiting

of a machine cannot be expected to eliminate the vibrations of a hanger bearing which carries the bet that drives the machine. In a certain factory the vibrations were caused by the lining of the sleeves of an overhead hanger bearing being worn as shown by the arrow in Figure 2. This allowed the shaft to wabble and impart a quivering motion to the machine through the driving belt. When new sleeves were inserted, the trouble ceased.

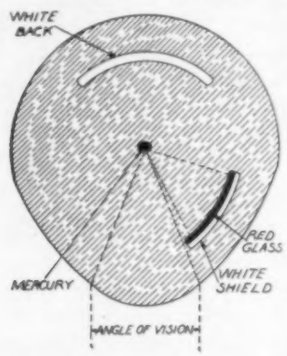
In another instance the linings of some of the bearings of a machine were so badly scored by wear that the effectiveness of the rubber foundation was lost. We dammed up the box ends on the shafts with putty, as shown in Figure 3, and after cleaning the parts poured babbitt metal through the oil holes with a tunnel, thus making new lining for the boxes and preventing further trouble from this source. Rubber foundations are effective for checking vibrations in all kinds of machinery, but they must be given reasonable conditions under which to operate.

Red-Reading Mercury Thermometer

WHAT is claimed to be the first easily visible mercury thermometer has been developed by the Palmer Company, Cincinnati (St. Bernard), O. Previous efforts to color the mercury for easy reading have never proved successful, but the problem has been solved in this new thermometer by means of reflection. The Palmer Red-Reading Mercury glass colors the mercury column to show a bright red instead of the regular silver mercury. The mercury itself is a natural color so that by placing a strip of



The New Palmer Red-Reading Mercury Thermometer



red colored glass to the side of the bore or reading column and by having this bore turned to a slant, the red glass is reflected onto the mercury column and when visioned through the lens in front of the tube, only the red color is seen. The construction of the glass is shown in the accompanying sectional view sketch. By this new and basic idea, the mercury is not disturbed or harmed by adding any chemical to change its color, and the thermometer presents the effect of a bright red column for reading with all the valuable properties of pure mercury. The new glass was developed under the personal supervision of Charles R. Palmer, president of the Palmer Company, and it is now being produced on a commercial basis, in all sizes and ranges of temperature suitable for all industrial purposes.

Rubber Paints

FROM Great Britain comes the report of new developments in the application of rubber as a protective coating on Duralumin and other aluminum alloys used in aircraft manufacture, to prevent corrosion. Heretofore various methods of painting or electro-deposition of an oxide film on metal have not proved entirely satisfactory because of the thinness of the film. Violent rubbing or distortion of the surface allows corrosion to begin.

The new method evolved consists of coating the metal with a thin film of rubber. The results so far obtained have been reported as highly satisfactory. The rubber provides an exceedingly flexible coating which will distort under load without fracturing. Any blow is taken through the rubber and unless it is sufficient to cause a major fracture the surface covering remains intact.

Rubber-Cushioned Railway Wheel

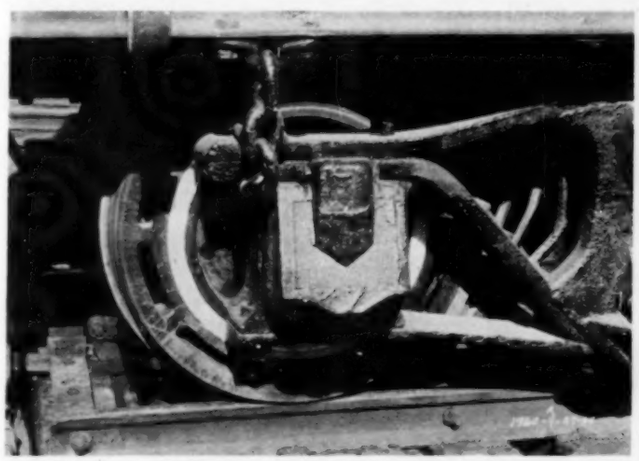
A RUBBER-CUSHIONED car wheel for railway passenger and freight cars, and adapted even to the great "Mogul" locomotives, has just been announced by the Goodyear Tire & Rubber Company. The new wheel, built partly of rubber, has been tested over many hundreds of miles on an engine of the Akron, Canton & Youngstown Railway.

"The cushioned car wheel, which we have developed and patented and put to a rigorous test on heavy grades, sharp curves and rough roadbeds, promises to add further comfort not alone to the Pullman passenger but to all aboard the train from the engineer and fireman in the locomotive cab to the flagman in the last coach," said C. Slusser, Goodyear vice-president and factory manager. "Its efficiency lies in its elasticity or flexibility.

"In addition to comfort provided by the wheel, saving in wear and tear on rolling stock and roadbeds is assured. The shocks that the ordinary car wheel is subjected to when it hits switches, joints and frogs are practically eliminated by the use of this new device, and this absence of shocks to bearings, axle and other mechanism means longer life to the rolling stock and in turn to roadbeds.

"The Goodyear cushioned car wheel is made much like the ordinary car wheel of all steel type, except that a cushion of uncured rubber is built between the hub and rim. After this operation the wheel with the rubber is put into the vulcanizer and cured much as a solid rubber truck tire is vulcanized firmly to the metal rim.

"A pocket inside the wheel holds the rubber pad, which is about two and one-half inches thick, six inches wide and tapers beadlike to a thickness of about one and one-fourth



Rubber-Cushioned Wheel on Railway Car. The pocket inside and around the wheel holds a rubber pad 2½" thick.

inches. This beadlike projection is the only portion of the flexible pad that is visible on the surface of the wheel.

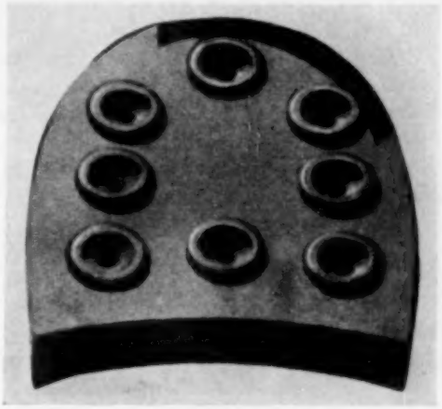
"It is obvious that heat is generated in a car wheel when brakes are applied, but the rubber cushion as it is installed it is not affected because of the ventilation secured by large holes in the disc-like wheel, giving the effect of a set of spokes between steel tire and steel rim.

"When the steel tire is worn out it can be removed, the rubber detached and the old hub again used in the construction of another complete wheel — and this operation can be repeated indefinitely—while the ordinary wheel when no longer usable must be sent to the scrap heap in its entirety. Thus another item of economy is shown in our type of wheel."

The Goodyear cushioned car wheel was worked out principally by E. F. Maas, who received his training in the Royal Technical School of Stockholm, Sweden, in which country he worked on ball and roller-bearing installation for railroad cars. He came to America to investigate the possibilities of a Swedish company attracting the attention of some railway in this country to its product.

A New Idea in Rubber Heels

TO prevent running rubber heels down on the sides, W. B. Johnson, formerly president of the Johnson Rubber Heel Company, which has now passed out of existence, has recently developed a new rubber heel with a patented hard rubber crescent-shaped plate. The plate is built into the striking edge of the heel in much the same



Johnson Heel Showing Hard Rubber Plate

way that metal plates have been used in the past. This operation is done at the same time as the heel is molded.

The new heel has been favorably commented upon by members of the shoe repair trade who have seen samples. Mr. Johnson is endeavoring to interest some manufacturing concern in the proposition and hopes to get the heel in production. Interested parties can reach him at 216 N. Gardiner Avenue, Rockford, Ill.

Carbon Black and Natural Gas Consumption

THE steady growth which has characterized the natural gas industry of the United States for a number of years was more than maintained in 1929, according to the reports of the Bureau of Mines.

Next to the consumption of natural gas for field purposes, which retains first rank among the various classes of consumption, the use of natural gas in the manufacture of carbon black ranks next. This use accounted for a consumption of 261,107,000,000 cubic feet in 1929, an increase over 1928 of 49 per cent. As was predicted a year ago, Texas became the leading carbon-black producing state in 1929. The production of carbon black in the Panhandle in 1929 was more than three times the 1928 total and, since the status of the industry in Louisiana was practically unchanged, the center of carbon black manufacture moved from Monroe to Amarillo.

New Tires for First Packard Car

The first automobile built by J. W. Packard is to be equipped with a new set of single tube tires and placed in the new Packard Laboratory at Lehigh University, Bethlehem, Pa. An order for the tires has been given to the B. F. Goodrich Company.

The car, an electrically powered single seater, requires 24 by 3 inch tires that must be fitted with lugs and cemented to the rim. Modern construction methods will be used in making the new set of tires, even though the old design is followed.

EDITORIAL COMMENT

Church Sermons to the Industry

WHEN condemnation of competitive methods in the rubber manufacturing industry becomes the text for Sunday church sermons, it is time to begin to believe that the industry is "being shot to Hell" or fast going to the devil. But in Akron the other day, the Reverend J. M. Russell, of the Monroe Memorial United Presbyterian Church, actually stood in his pulpit and denounced the "ruthless and cut-throat competition among the Akron rubber companies," in no uncertain language.

"Our industrial heads are no doubt very excellent gentlemen, but they are extremely individualistic in the management of their business," asserted Rev. Mr. Russell. "They have forgotten the principle of 'live and let live.'

"Our tire industry has reached the state where wage and salary cuts are being made wholesale and old-time employes are being laid off to join the ever-increasing army of unemployed," he declared in his sermon on "Poise or Panic."

"Why cannot our rubber magnates act like gentlemen toward one another and get together for the stabilizing of the price of rubber tires?

"A little good will on the part of our industrial leaders would put an end to this demoralizing condition that is affecting the prosperity of our city."

It is a new departure to see the churches taking a position on the ethics of "cut-throat competition" and "unemployment," but maybe the country needs it, and they could not hit on a better industry at the present time to drive home their points than the rubber industry. The Reverend Russell is not alone in his thoughts. In fact his sermon sounds very much like F. A. Seiberling speaking again.

Business is Traveling Sideways

A SLIGHT change for the better was noted in general business conditions in September but the gains were of only normal seasonal proportions, according to the last trade analysis of Colonel L. P. Ayres of the Cleveland Trust Company. His comments on the automotive and tire trade are quoted elsewhere in the columns of this issue, but his conclusions on the general situation deserve editorial comment.

"It is encouraging to note that business activity is no longer slowing down," says Colonel Ayres. "It is moving sideways at a low level, but it is not getting worse. It seems probable that we have reached the bottom of the depression, but there is no sure method for estimating how long the bottom may prove to be. Already this depression has lasted rather longer than have most of the major depressions of recent decades, and that is one good reason for believing that some measure of improvement is likely to develop before long."

Examining wholesale prices, the banker finds that while generally during depressions business does not recover until prices definitely begin to advance, there are enough exceptions to show that the rule is not trustworthy. "A good many indications of greater price stability are appearing," Colonel Ayres asserts.

"The readjustments that start recovery on its way work themselves through in relatively uniform periods of time. Excess stocks of goods get worked off. Shortages develop. Idle hands seek employment. Business men and industrialists call on their reserves of initiative. Decreased costs of construction stimulate new building. These forces ferment silently and invisibly. Finally they become effective and apparent. They are at work now, and they will bring recovery from this depression, as they always have from former depressions.

"Yields on common stocks of the highest grade are still relatively low, but the prices on the great mass of less choice issues have been working downward until their yields are now becoming fairly generous. By the end of September, more than half of all the stocks listed on the New York Exchange had fallen to prices lower than those reached in the great decline of last November. Many of them had gone a good deal lower than they did last autumn, with the result that the average yields on all the dividend-paying common stocks were higher at the close of September than they had been at the end of any previous month in the past two years."

He finds that the iron and steel industry has suffered less in this depression than in previous similar periods and expresses the belief that building construction and automobile manufacturing will show important increases next spring, after having suffered severe declines this year.

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

RUBBER MEN ORGANIZE NEW MOLDING COMPANY

The firm of Stringfield & Oedekerk has been established for the custom molding of Bakelite and the building of molds by R. B. Stringfield and Martin Oedekerk, formerly of the Golden State Rubber Mills, Los Angeles, Cal. Headquarters have been located at 762 East Slauson Avenue, Los Angeles.

Mr. Stringfield had previously served as chief chemist for the Goodyear Tire & Rubber Company of California and the Butte & Superior Mining Company and also as consultant for several organizations. Mr. Oedekerk has had long experience in machine design and die construction with the Studebaker Corporation and other firms.

DAYTON TO MAKE BELTS FOR LIGHTING OF TRAINS

By a contract agreed to on October 11 between the Dayton Rubber Manufacturing Company and Herr Rudolf Roderwald, Berlin inventor and belting specialist, a new and immensely profitable new field has been opened up for the Dayton concern, according to its president, John A. MacMillan.

Making and distributing the German inventor's device for stabilizing the electric light current in railroad cars will be entirely in the hands of the local company, so far as the markets of North and South America are concerned. A rubber belting especially designed for important industrial uses is also included in the arrangement.

Within 60 days the factory equipment needed for the new processes will be received here from Germany and work will begin. Mr. MacMillan said recently that his company had been interested in the proposition for the past two years.

Substitution of rubber for leather belting in the coupling between lighting dynamo and car wheels is the important element in the new device perfected by Herr Roderwald. It is said to be already in use on 2,300 cars of German railroads, with two Canadian railroads having agreed to test it out.

Rubber Markers for Cleveland

The city of Cleveland, O., is planning to purchase from 25,000 to 30,000 rubber traffic markers to replace painted lines now used on main thoroughfares. The markers, which can be used only on asphalt streets, will cost approximately $50,000.

New Firestone Truck Rim

The Firestone Steel Products Company has recently developed and is now in production on a new type "R" truck rim. The "R" rim has features new in truck rims yet is interchangeable on the same wheels with other types of Firestone truck rims, since the standard 28-degree Firestone mounting bevel has not been altered. Durable, made in one piece, solid and secure, the new product is a continuous base rim with one side flange integral with the base and one continuous removable side ring.

Monobloc Company Auction

Plans for the reorganization or rehabilitation of the Monobloc Company, manufacturers of battery cases and other composition products, having failed, the entire equipment of machinery, raw materials, dies, molds, etc., will be sold at public auction at the plant at New Philadelphia, O., on October 27 at 1 P. M. In addition to 100,000 battery cases, a large quantity of cotton linters in original bales, and other raw materials, there will be offered a line of Wellman-Seaver Morgan 60-inch mixing mills, Banbury and other motor-driven mixers, vertical hydraulic presses, vulcanizers and other rubber and composition manufacturing equipment, together with machine tools, laboratory and office equipment. The auctioneer is to be the Industrial Plants Corporation, 25 Church Street, New York City.

I. C. C. DELAYS DECISION ON RUBBER FREIGHT RATE

Rubber manufacturers may be compelled to wait weeks or months for a decision on their complaint against existing freight rates on crude rubber, officials of the Interstate Commerce Commission indicated a few days ago. The commission says its examiners are working as rapidly as possible on the case, which was argued more than six months ago but that a decision may not be forthcoming until after the first of the year.

A part of the delay in the rubber case is blamed on the large number of technical adjustments facing the commission as a result of sweeping changes in central and eastern freight rate structures brought about last July.

At the time, that decision was believed to hold out hope for crude rubber rate reductions. Commissioner Eastman, who wrote the opinion, pointed to rubber as one of the commodities that, possibly, should be given a rate less than fourth class. He added, "The new rate structure will facilitate such redistributions."

RAINBOW TIRE & RUBBER IS TO BE REORGANIZED

Reorganization of the Rainbow Tire & Rubber Company, which has a factory at Delaware, O., and temporary offices at Columbus, O., is reported as being nearly completed. A meeting of the directors of the company at Columbus was held on October 9. It was said that Boston capital has been interested in the enterprise, and company officials are attempting to decide whether offices will remain in Columbus or be moved to Boston.

The Rainbow plant was opened in 1927 for the manufacture of the Ross Truss tube and was in operation until June, 1928, when it was announced that operations had been suspended to permit the installation of new tire making machinery. At that time it was stated that equipment would be added to bring the capacity of the plant to 3,000 tubes and 1,500 tires daily with employes on a two-shift basis. Due to the unsettled conditions in the industry, however, the plant has remained closed up to the present time.

THERMOID COMPANY SALES SHOW BETTER PROGRESS

R. J. Stokes, president of the Thermoid Company, Trenton, N. J., in his letter to stockholders announcing declaration of regular quarterly dividend of $1.75 on the preferred stock, payable November 1 to stock of record October 15, states:

"Despite the general business depression, sales of the Thermoid Company since the turn of the half year have been progressing satisfactorily. While our volume of business has declined as compared with a year ago, the company, according to preliminary figures, shows a profit for the third quarter available for its preferred and common stocks, after deductions for interest, depreciation, etc. Business thus far in October for Thermoid and its subsidiaries looks better than it has for the past several months."

Sales of the Southern Asbestos Company subsidiary of Thermoid, showed an increase of 85% in September over the preceding month, Mr. Stokes stated. "Southern Asbestos," he continued, "has introduced 21 new products which will enable the company to offer a more complete and well-rounded service, and which should add considerably to its gross business."

Merritt Cooke, of Brooke, Stokes & Co., Philadelphia, has been elected a director of the Thermoid Company.

OUTPUT OF U. S. TIRES IS INCREASED BY 22%

A daily production schedule 22 per cent greater than August was maintained during September by the tire department of the United States Rubber Company. The company planned to continue this same increased production schedule through October.

The increased production schedule is unusual at this time, states J. F. O'Shaughnessy, general manager, because tire production usually tapers off toward the end of August and is at a seasonal low ebb for the remaining months of the year. The September schedule will be tied with June for the third greatest production month of this year, being exceeded only by April and May, the peak production months for tires. In spite of these production records, the company shows an inventory of finished tires on hand, both at Detroit and in the field, of 25 per cent below the figures as of September last year.

Employment statistics at the plant reveal the fact that labor has, during the past year of otherwise general unemployment and labor fluctuations, been maintained at a fairly consistent level. Mr. O'Shaughnessy attributes the increasing production to extension and increasing of the dealer organization and the somewhat upward trend noted in a number of basic lines of business.

AKRON RECLAIM WORKERS WILL HELP UNEMPLOYED

Employes and officers of the Akron Rubber Reclaiming Company propose to put into effect a new plan for the aid of their fellow workmen who have recently been laid off because of the current depression. Under the leadership of William M. Welch, president of the company, the entire personnel of the Barberton factory has agreed to set aside five per cent of their wages and salaries each month to contribute to a fund that will be devoted to providing general relief for former employes who have lost their jobs because of the restricted activities of the plant within the last few months. A committee of employes will be named to handle the fund and to take care of disbursements.

"Not charity, but a respectful gesture of friendly encouragement to the men and their families who have labored with us," explained President Welch in describing the purpose of the move. "The original suggestion that a fund be raised came from a group of employes. This is in no sense a company activity, and will in no way take the place of the community fund. The directors of the company undoubtedly will make a contribution from company funds to the community fund this year as they have in the past."

U. S. Sells Slipper Firm

The United States Rubber Company has sold the Dolgeville Slipper Company, Inc., to Henry I. Patrie and William Menge, Jr., from whom it was purchased eleven years ago. The "U. S." Snug-ler line of felt slippers will be continued in some of the company's branches.

C. B. Kaufman

C. B. Kaufman, member of the Rubber Exchange of New York and senior partner in the firm of C. B. Kaufman & Company, died on October 16. He was elected a member of the exchange on January 28, 1926.

Herbert H. Dow

Herbert H. Dow, president and general manager of the Dow Chemical Company, Midland, Mich., died on October 15 at the Kahler Hospital, Rochester, Minn., following an operation for a liver ailment. He was 64 years of age.

Born at Belleville, Ont., February 26, 1866, Dr. Dow was graduated from the Case School of Applied Science in Cleveland in 1888 and for a year thereafter was professor of chemistry and toxicology at the Huron Street Hospital in Cleveland. In 1890 he founded the Midland Chemical Company for the manufacture of bromine and later the Dow Process Company for the production of bleaching powder, both of which were absorbed by the Dow Chemical Company in 1897. He discovered the first electrolytic process for making bromine and "Dowmetal" (magnesium alloy). He was the first American manufacturer of carbon tetrachloride (1900) and indigo (1917).

This year he was given the Perkin Medal by the Society of Chemical Industry, awarded annually for "the most valuable work in applied chemistry."

Sweeney Forms Own Firm

E. C. Sweeney has resigned as vice-president of Whitehouse, Davis & Company, Inc., New York City, but will himself continue as an importer and dealer in crude rubber at the same address, 27-29 Water Street. Mr. Sweeney was a pioneer in the New York rubber trade, having first entered it in 1909.

GOODRICH IS PRODUCING RUBBER RUNNING BOARDS

The development of a new department in the B. F. Goodrich Company plant at Akron for the manufacture of automobile running boards is reported as giving employment to scores of men, including many who had faced a lay-off by reason of the transfer of the firm's shoe manufacturing to Watertown, Mass.

Rubber running boards, fitting and equipped to the steel by a new process, are being turned out at the Goodrich factory in wholesale quantities to supply several large automobile plants. The units are completely assembled at Akron.

In the process, which is exclusively controlled by Goodrich, plant officials say, the rubber is vulcanized to the steel and the product is said to combine exceptional durability with light weight and attractive appearance.

The new department is working two shifts to take care of the orders already received.

The name of the sundries department of the United States Rubber Company has been officially changed. In the future it will be known as the general products department.

GOODRICH TIRE SALES RUNNING AHEAD OF 1929

Tire sales to dealers for September substantially exceeded the volume for the same month last year, according to a statement given out by the B. F. Goodrich Rubber Company. The month's statistics, proving that renewal tire business has shown marked improvement during the last thirty days, is regarded as one of the most encouraging sales reports of the year.

It is expected that final complete figures will show that not only did dealers' sales for September surpass the mark during the same period in 1929, but will closely approximate sales totals during August of this year, Goodrich sales executives declared.

July and August are generally considered the best tire sales months, so that the September report, which instead of showing the expected seasonal decrease in tire sales, indicated a definite upswing in the business of tire dealers generally, is unusual, company officials say.

A. J. Stephens in Bankruptcy

The A. J. Stephens Company, Kansas City, Mo., has been adjudged in bankruptcy by the federal district court, together with its associated organization, the Apex Rubber Company. The first meeting of creditors was held on October 20. The company had recently been engaged in the manufacture of rubber greens for miniature golf courses.

Stedman Preferred Dividend

The board of directors of the Stedman Rubber Flooring Company, South Braintree, Mass., declared the 48th consecutive quarterly dividend of $1.75 a share on the preferred stock of the company. The dividend was paid October 1 to stockholders of record at the close of business September 28.

Rubber Stocks at New Lows

More than twenty common and preferred stocks of leading rubber companies touched new lows for 1930 or longer during the fortnight. Closing prices on October 21 compare with the close on October 6 as follows:

	Last Price		—1930—	
	Oct. 21	Oct. 6	High	Low
Aetna	—	—	8½	3½
Ajax	¾	⅞	2½	½
Amer. Hard Rubber	—	—	81	50
Dayton "A"	—	—	3⅞	3¾
Falls	—	—	4¾	3
Faultless	—	35¼	37	33¾
Firestone	15¾	—	33¼	15⅝
do. 6% pfd.	56¼	—	87⅞	53⅝
Fisk	1¼	1½	5½	1
do. 1st pfd.	4½	—	21	2¾
General	—	—	163	110
do. pfd.	—	—	91	83½
Goodrich	15⅝	18⅜	58½	15¼
do. pfd.	70	77	104½	70
Goodyear	37¼	44¾	96⅞	36
do. 1st pfd.	80	—	102	80
India	—	—	25½	8½
Intercontinental	—	—	7½	2⅛
Kelly-Springfield	2	2¼	6⅛	1⅞
do. 6% pfd.	—	—	39	29
Lee	3⅝	4	11	3½
Mohawk	—	—	16⅝	6
do. pfd.	—	—	55	15
Norwalk	⅞	—	4	⅜
Pirelli	38¼	39	50⅞	37½
Raybestos-Manhattan	20	23⅝	58⅞	19¾
Seiberling	—	—	18½	4
do. pfd.	—	35½	78	30
U. S. Rubber	12	15½	35	11
do. pfd.	24	30¼	63⅞	21½

Names in the News

J. F. JONES, who resigned last June as vice-president in charge of sales of the Mohawk Rubber Company, has been named by the Pennsylvania Rubber Company as eastern district manager in charge of the Detroit, Chicago, Kansas City and Dallas regional zones. Mr. Jones has been active in the tire trade for 14 years, having been with the Mohawk organization from 1923 to 1930 and prior to that with the Portage Rubber Company, Barberton, O., and the Gates Rubber Company, Denver, Col. In addition to his work in the tire industry, his business experience since 1895 has included positions with Montgomery Ward & Company, Armour & Company, the Barsmith Ice Machine Company, the Canister Company and the Republic Can & Metal Company.

W. H. SHIELDS, rubber chemist of Moore & Munger, New York City, has just returned from a three-month stay at the company's mines at Dry Branch and Gordon, Ga., where he worked on problems concerning increasing and improving the output of the mines. The outlook for increased use of Catalpo during 1931 is very promising, according to Mr. Shields.

JOHN A. MCINTOSH, for many years assistant to the manager of mechanical sales of the United States Rubber Company, retired from active service on October 1. He originally started work with the Revere Rubber Company, a U. S. subsidiary, in 1891, being later promoted to general sales manager of that unit and in 1923 to the post he held at the time of his retirement.

J. W. BICKNELL, president of the United States Rubber Plantations, Inc., has returned to his headquarters at Medan, Sumatra. He sailed from New York on September 1 after spending four months at the company's offices in that city.

PAUL R. MAHONY, executive vice-president of the International B. F. Goodrich Corporation, will speak before the Cleveland Chamber of Commerce on October 28.

CHARLES E. GUEST, vice-president and general manager of the United States Rubber Export Company, who is on a tour of the overseas branches, sailed from Calcutta, October 1, for a visit to the plantations and the Batavia branch. He had spent ten days in Calcutta after arriving from Durban, South Africa.

A. L. FREEDLANDER, vice-president in charge of production for the Dayton Rubber Manufacturing Company, Dayton, O., has just returned from an extended tour of the west and southwest sections of the country. He reports that the company's distributors in that territory have been doing an excellent volume of business.

U. S. Names Scribner to Head New Roll-Tank Lining Unit

The United States Rubber Company announced that the new plant of its mechanical department at Provilence, R. I., for manufacturing rubber-covered rolls and tank lining is now operating at capacity. E. H. Scribner, formerly factory manager at the old Chelsea plant, is factory manager at the new unit which has shown such a steady increase in business since the transfer that day and night shifts are necessary to keep up with orders.

On December 27, Mr. Scribner will complete 39 years in the service of the United States Rubber Company. Except for a few months' work as errand boy when he left school, his entire business career has been with the U. S. organization.

Photo Bachrach

E. H. SCRIBNER

Born in North Attleboro, Mass., where he attended the public schools and a private preparatory school, he went to work as a workman in the tubing department of the Revere Rubber Company at Chelsea shortly after finishing his school work. His first important promotion came eight years later, in 1907, when he was made a foreman. In 1909 he was named assistant superintendent, and a year later superintendent, a post which he held for three years.

In 1913 he was appointed factory manager of the Chelsea plant, the position he held until the plant was closed a few weeks ago, when he was transferred to act as head of the new rubber roll and tank lining factory.

DONALD G. CAMERON has been appointed sales manager at the head office of the Trowbridge Tyre & Rubber Company, Ltd., London, England, while W. A. STARLEY will continue to act as southern regional sales manager.

HARVEY S. FIRESTONE, JR., vice-president of the Firestone Tire & Rubber Company, landed at New York, October 3, after an extended business trip through South America. He stated that business in South America has been picking up appreciably under the direction of the new governments in Peru, Bolivia and Argentina.

M. F. BLAKESLEE has been appointed by the United States Rubber Company as manager of tire sales of the Dallas district. Prior to this appointment, he was engaged in special merchandising work for the company at the general offices at Detroit, Mich.

GEORGE M. HAWKINS, manager of the real estate department of the Goodyear Tire & Rubber Company, was reelected a director of the Akron Automobile Club at the meeting of the members on October 9.

SIR GEORGE BEHARRELL, managing director of the Dunlop Rubber Company, Ltd., arrived in the United States recently for a business visit.

ELLIOT H. SIMPSON, of the firm of M. Rothschild & Company, New York City, sailed October 10 on the S. S. *Empress of Russia* for Singapore to begin a survey of conditions in the rubber producing sections of the Far East.

P. W. LITCHFIELD, president of the Goodyear Tire & Rubber Company and the Goodyear-Zeppelin Corporation, has in a recent statement declared his opposition to the unrestricted exportation of helium as suggested in some quarters after the R-101 disaster. He announced himself in favor of such restricted exports of the gas as would not thwart the country's best commercial and military interests.

J. RIVES CHILDS, American consul to Rumania, spoke before the Akron Export Club on October 14 and described the rise of American tires in Bucharest at the expense of the leading French manufacturer. He said that there are now 38,000 automobiles in operation in the Rumanian capital, 60 per cent of which are of American manufacture.

CATALPO
for
Footwear

Current Crude Rubber Items

SHIP RUBBER TO AKRON VIA N. Y. BARGE CANAL

Shipments of crude rubber from the Far East, reaching this country through the Port of New York, are making their way toward Akron for the first time over the barge canal route from New York to Buffalo. The B. F. Goodrich Company, the Firestone Tire & Rubber Company and the Goodyear Tire & Rubber Company all share in the shipments, and traffic managers for the three firms are much interested in the new plan.

"The volume of rubber reaching Akron through the canal is greater than ever before," said H. J. Zimmerman, traffic manager for the B. F. Goodrich Company, "and we expect to utilize the canal to a greater extent next year. I understand there has been some congestion at the port of Buffalo because of the sudden appearance there of a fleet of barges loaded with crude rubber."

The Goodyear traffic department stated that the experiment with the barge route appeared to be highly successful.

LONDON RUBBER IMPORTS CONTINUE TO BE HIGH

Imports of crude rubber into London during the month of September totaled 422,562 centals, against 232,259 centals in August, and 461,217 centals in September last year, according to the London Board of Trade report.

Exports of crude rubber from London last month were 63,813 centals, against 44,792 centals in August and 80,182 centals in September, 1929. Rubber shipments from London to America in September were 1,352 centals, against 1,636 centals in the previous month and 1,836 centals in September of last year.

Ceylon Shipments Higher

Ceylon shipments of crude rubber during September totaled 7,878 tons, as compared with 6,701 tons in the previous month, according to cables to the Rubber Exchange of New York. September shipments from Ceylon to the United States were 4,942 tons, against 3,362 tons in August.

ANGLO-DUTCH ESTATES WILL RESTRICT OUTPUT

A substantial reduction in crude rubber production in the Far East is expected as a result of the decision of the Anglo-Dutch Plantations of Java to cease production on some of its properties, but the cut in output will be too small to appreciably affect the market unless other companies take similar action, according to advices contained in a London cable to the Rubber Exchange of New York.

"With reference to the cable stating that the directors of the Anglo-Dutch Plantations at Java have given instructions to cease production on estates outside of the original Pamanoekan and Tjiamsem lands, in view of the uneconomic price of rubber," the report said, "cable advices state that the company owned 31,509 acres planted with rubber. The total output of all its estates during 1929, including 3,000,000 pounds from the P. & T. lands, was 13,129,158 pounds, produced at a cost of 6.31 d. a pound and with a selling price averaging 9.54 d. a pound.

"The reduction in output is looked upon as a favorable sign as far as the market is concerned, but the amount involved is too small to have any marked effect.

"Replies to Reuter's inquiry as to whether other large companies contemplate action similar to that of the Anglo-Dutch Plantations of Java were non-committal."

ERIC MACFAYDEN SEES LOWER OUTPUT IN 1931

That a continuance of low prices for crude rubber will bring 1931 production down to about 780,000 tons and that a further increase in world rubber stocks is unlikely next year was predicted by Eric Macfadyen, former chairman of the Rubber Growers' Association, in a statement made late last month to the London *Economist*.

"World production in 1929 amounted to 840,000 tons," he stated. "In 1930, we should normally have seen an increase, but it is now apparent that there will be a falling-off to, say, 810,000 tons. (This total may be composed of 475,000 estate produce; 315,000 tons grown by native small holders; and 20,000 tons wild rubber.) With a continuance of low prices a further decline—perhaps to about 780,000 tons—should be seen in 1931. Absorption by manufacturers in 1929 may be put at 805,000 tons (U. S. A., 470,000 tons; other countries, 335,000 tons). Absorption in 1930 looks like being no more than, possibly, 725,000 tons. On these estimates 120,000 tons will have been added to world stocks in 1929 and 1930.

"In the past, we have no experience of a downward curve in rubber consumption for so long a period as two years; and even under existing circumstances it is probable we shall see a reversal of the downward tendency long before the end of another year. A further increase in stocks is improbable in 1931.

"For the current volume of turnover the weight of world stocks is not unduly heavy; but the current rate of output is below and, in another year, will be well below, the potential. From now on, therefore, supply should be elastic; and any marked tendency towards a rise in price is likely to be damped down by expansion of output. The indications are for a prolonged spell of more stable prices than we have enjoyed in the past, with only intermittent demand for the produce of the marginal producer, though with fair profits for the most economical. Among the latter will be found, no doubt, the more favorably situated small holders in the various Eastern countries; but scientifically organized estates will continue to supply the bulk of the demand.

Closing Prices on Rubber Exchange of New York, Inc.

FROM OCTOBER 4 TO OCTOBER 18, 1930

		Spot	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Sales
No. 1 Standard Contract of 10 Tons															
Oct.	4	7.92	7.98	8.00	8.08	8.21	8.33	8.45	8.57	8.68	8.79	8.90	9.05	9.20	20
	6	7.82	7.55	7.70	7.83	7.90	8.00	8.10	8.20	8.30	8.45	8.60	8.68	8.85	50
	7	7.75	7.80	7.90	7.96	8.09	8.22	8.35	8.47	8.58	8.70	8.82	8.94	9.10	15
	8	7.95	7.98	8.07	8.16	8.26	8.35	8.45	8.55	8.65	8.78	8.90	9.05	9.20	30
	9	8.05	8.00	8.09	8.18	8.29	8.39	8.50	8.60	8.70	8.82	8.95	9.12	9.29	37
	10	7.87	7.70	7.80	7.95	8.10	8.20	8.35	8.45	8.55	8.68	8.80	8.95	9.10	4
	14	8.00	7.86	7.96	8.06	8.18	8.30	8.42	8.52	8.62	8.74	8.85	8.98	9.12	4
	15	7.95	7.96	8.06	8.15	8.27	8.38	8.50	8.64	8.78	8.89	9.00	9.12	9.25	6
	16	8.00	7.80	7.90	8.05	8.17	8.28	8.40	8.51	8.62	8.74	8.85	8.98	9.10	3
	17	8.00	7.80	7.90	8.10	8.20	8.25	8.38	8.49	8.60	8.70	8.80	9.00	9.10	32
	18	8.06	8.00	8.10	8.20	8.32	8.43	8.55	8.68	8.80	8.88	8.95	9.09	9.22	16
"A" Contract of 2½ Tons															
Oct.	4	——	7.90	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.70	8.80	8.90	9.10	183
	6	——	7.40	7.50	7.60	7.70	7.80	8.00	8.10	8.20	8.30	8.40	8.50	8.70	115
	7	——	7.70	7.80	7.90	8.00	8.10	8.20	8.30	8.50	8.60	8.70	8.80	9.00	54
	8	——	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.10	182
	9	——	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.90	9.00	9.20	200
	10	——	7.60	7.70	7.80	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.90	135
	14	——	7.80	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	9.00	3
	15	——	7.90	8.00	8.00	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.10	42
	16	——	7.70	7.80	7.90	8.10	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	29
	17	——	7.70	7.80	8.00	8.10	8.10	8.20	8.40	8.50	8.70	8.70	8.90	9.10	34
	18	——	7.90	8.00	8.10	8.20	8.30	8.30	8.50	8.70	8.80	8.90	9.00	9.10	5

CATALPO
for
Inner Tubes

Rubber Goods and Specialties

Victory Basketball Shoe

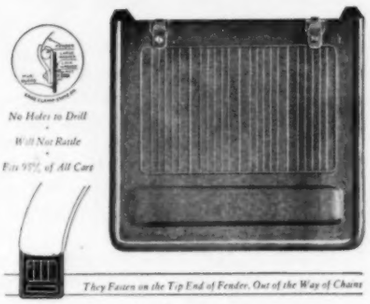
Under the name of the Victory, the B. F. Goodrich Footwear Corporation, Watertown, Mass., is introducing a new basketball shoe that is advertised as form-fitting, with felt-padded tongue, cushion-heel seat, barred-toe cap, instep reinforcements, and finished in buff with russet trim. The sole of this

shoe has no turned-over foxing to slough loose, but instead the finest anti-slip compound vulcanized into the sanded sole of patented, solid construction.

Kleinert Watch Container

An attractive and useful novelty has just been introduced by the I. B. Kleinert Rubber Company, 485 Fifth avenue, New York City, in the form of a molded rubber miniature clock or watch container into which practically any standard size watch can be slipped. There is an opening at the bottom

of the container, which, when squeezed between the fingers, opens sufficiently to allow one to slip in the watch. If the watch is fitted correctly into the groove allowed for it, it will be held securely and will eliminate any chance of its being broken if knocked to the floor. This container is furnished in various marble colors, including black and white, green and white, rose and white, blue and white, and orchid and white. These containers are made with a four-inch base and are three and a half inches high.



Rubber Mud Guards

In addition to its line of fabric mud guards, The Crawford Manufacturing Company, Inc., Richmond, Va., is now introducing a new mud guard made of soft flexible rubber in one size to fit 95 per cent of all cars. These new mud guards are molded in an artistic design which adds to the appearance of the car and will protect it from mud, tar and oil and save the car owner the cost of many car washings. The guards are equipped with a new type fastener which eliminates the necessity of drilling holes in the fender. They are clamped on quickly and easily to the tip end of the fender, out of the way of the tire chain.

Goodrich Rubber Mattress

Engineers of the B. F. Goodrich Company are reported to be working out a new type of rubber-lined, air-inflated mattress in cooperation with the Simmons Company, bedding and furniture manufacturers. Goodrich officials have stated that experiments have been under way for some time, but declare that no model has as yet been produced. Other mattress manufacturers have experimented with the same kind of project, but the difficulty in building an inflated mattress that would endure after continuous use proved too great.

Playboy Rubber Fabric Outfit

Protection against winter cold and wet is assured in this Playboy outfit for boys and girls, especially designed to give waterproofing where required and added warmth and comfort where needed, no matter how damp or cold the weather may be. Proof against dampness is assured through the exclusive use of Armor Quality du Pont Fairfield fabric in all parts where waterproof material is necessary. This new rubberized fabric is a recent development of E. I. du Pont de Nemours & Company for outdoor apparel,

and it is used on the bottom of the legging and on the body of the garment. The upper part of the legging and the sleeves and collar of the jacket are supplied in imported suede cloth treated so as to be water-repellent. There is a hat to match made of the same combination as the garment. The outfit is manufactured by Sav-Ose, Inc., 229 West 36th Street, New York City.

Peerless Beach Back

The Tucker Duck & Rubber Company, Fort Smith, Ark., is now offering a new back rest under the name of the Peerless Beach Back. It is adjustable to four positions and has a canvas apron 18 inches long.

Coach Basketball Shoe

This lace-to-toe model basketball shoe, designed for college and professional teams, is being offered by the Servus Rubber Company, Rock Island, Ill., under the name Coach. It has a non-slip, compounded rubber sole, a sponge rubber cushion heel, Keneva non-heat insole, wide supporting saddle strap, special arch support, heavy bat wing toe cap and stubber toe guards. The upper is heavy, brown or white, army duck with seamless loose lining.

Rubber News Around the World

POLISH RUBBER CONCERNS ORGANIZE SALES CARTEL

In line with the general "cartelization" policy of Polish industry, the latest branch to establish a so-called syndicate is the rubber industry. Virtually all the major industries of Poland now have their cartel — in many cases for the "rationalization" of production, and in all cases for centralizing sales in the home market. It is the understanding that all the manufacturers of any importance have joined the Rubber Cartel.

The rubber manufacturers began by establishing a central sales organization known as the "Polgum," and, according to newspaper announcements, arrangements have recently been made with the leading wholesale distributors to establish standard sales conditions and to maintain uniform prices throughout the trade. To begin with, it has been decided to decrease wholesale prices by 10 per cent, and to grant wholesale distributors a uniform 10 per cent discount. Ninety-day manufacturers' credits will be continued. Special arrangements are being made, it is further announced, for eliminating superfluous foreign credits, with wholesale houses agreeing to cooperate in every way possible with the industry to encourage the sale of domestic products. To this end, dealers selling exclusively Polish-made rubber goods will be given an extra 3 per cent discount.

The action of the Rubber Cartel in reducing prices by 10 per cent is quite contrary to the practice of other Polish cartels, whose principal object is usually to maintain selling prices at a level much higher than is justified by market conditions, and by the prevailing prices of raw commodities. Keen foreign competition, presumably, has dictated the apparently more reasonable attitude of the rubber industry.

WILL THERE BE A RUBBER SHORTAGE IN 1935?

SO predicts Lt.-Colonel J. C. G. Kunhardt in his much discussed booklet on "The Future of Rubber", which has been extensively reviewed recently both here and abroad. It is now available in this country exclusively through THE RUBBER AGE. The booklet, published by the Rubber Shareholders Section of the Institution of the Rubber Industry, London, is the most comprehensive survey of the present conditions surrounding the rubber growing industry. The startling conclusions reached by the author and his predictions as to the possible situation in the next few years will make interesting reading to all those associated with the industry. The booklet will be sent upon receipt of 65 cents (stamps or currency) by THE RUBBER AGE, 250 West 57th Street, New York City, N. Y.

British Trade Unchanged

London cables to the Department of Commerce this month state that British tire manufacturers are working on part-time schedules. Tires are in steady demand, but are being bought in small lots for immediate sale. The rubber footwear trade is normal, but there is an increased demand for waterproof garments and rubberized fabrics.

Dunlop Maintains Dividend

The Dunlop Rubber Company, Ltd., has declared an interim dividend of 6 per cent, according to an announcement by Sir Eric Geddes, chairman. This is the same as a year ago, when the payment of interim dividends was resumed after a lapse of ten years. The maintenance of the interim dividend, however, does not necessarily mean that the total distribution for the year of 15 per cent will be maintained.

Rubber Horseshoes in Norway

The Norske Galosche & Gummivarefabrik of Norway has taken up the manufacture of rubber horseshoes, which are not yet used in Norway, but are exported, mostly to Great Britain. It is stated that such a rubber horseshoe will outlast three iron shoes and is cheaper to use. The rubber is reinforced with steel.

British Cable Dividend

The directors of British Insulated Cables, Ltd., have announced an interim dividend of 1 s. per share on the ordinary capital stock. This is at the same rate as was declared during 1929.

August Golf Ball Imports

Golf ball imports into the United States fell off in August to 110,632 balls, valued at $36,103, as compared with imports in August, 1929, of 370,992 balls, worth $120,534. This is the sixth successive month in which imports have fallen below the corresponding month of last year. The unit value per ball in August was 32.6 cents as compared to 32.4 cents in July and 32.5 cents in June.

Raincoat Market in Japan

There is a considerable demand for raincoats of every type in the Taiwan district owing to the long rainy season. The use of raincoats is confined almost entirely to men and children who wear foreign style clothing as only a few of the women have adopted the Western style of dress. The value of annual sales is estimated as being approximately $498,500. Full-length coats are preferred; those for men retail from $3 to $12.50 and for children from $2 to $7.50. The majority of the firms in Taiwan prefer to import them directly through connections in Japan proper.

SWEDISH TIRE OUTPUT SHOWS STEADY INCREASE

Automobile and truck tire production in Sweden, heretofore, has been negligible, but within the past few years the domestic industry has shown excellent progress, according to Department of Commerce reports. The first creditable production was in 1928 when figures were around 25,000 units. For this output two factories were responsible—Gislaved and Trelleborg—both taking their trade names from the towns in which they are located. Gislaved is controlled by the powerful Cooperative Union and is distributed through its many firms throughout the Kingdom. Trelleborg tires are handled through the company's selling agency at Stockholm.

During 1929, the activity of the local factories were even greater than in 1928. It is estimated that Gislaved produced 18,000 tires and supplied from 10 to 15 per cent of the domestic consumption. Gislaved supplies the original equipment for the "Volvo," the only passenger car at present manufactured in Sweden. Trelleborg furnished about 5 per cent of the local consumption and during 1929 was compelled to enlarge its plant as a result of the increased demand.

Imports of pneumatic tires for automobiles and trucks into Sweden continue to increase —1,578,900 kilos in 1928 and 1,809,515 kilos in 1929—in spite of the growing domestic production. The United States during 1929 supplied more than 75 per cent of the total imports, but the United Kingdom and Germany registered gains as compared with the previous year. Other participating nations were, in the order of importance, France and Belgium. Italy was negligible. About 2,900 kilos were received from Soviet Russia.

EASTERN STOCKS GAIN; OUTPUT SLIGHTLY LOWER

Production of crude rubber on estates of more than 100 acres in the Far East during September totaled 22,172 tons, against 23,796 tons in August. Stocks on estates on September 30 were 26,573 tons, against 26,430 tons on August 31.

Dealers' stocks in the Far East (excluding Singapore and Penang) as of September 30 aggregated 16,116 tons, as compared with holdings of 15,775 tons at the end of the previous month.

New Australian Company

The Renown Rubber Company, Ltd., has been organized at Brisbane, Australia, with a nominal capital of £1,000,000, or approximately $4,860,000, and has been granted exemption from the state income tax for a period of five years by the Queensland government. The Queensland directors of the firm include R. C. Hancock E. Hill and R. W. Musson. The company has acquired the State Timber Works at Ipswich Road, South Brisbane.

DOMINION RUBBER FIRM CLOSES ELMIRA FACTORY

The Elmira, Ont., rubber factory of the Dominion Rubber Company, Ltd., has been closed down permanently, according to J. Dempsey, manager of the company's footwear division. The manufacture of tennis shoes, which was the main work carried on at Elmira, has been concentrated at the company's larger plant at St. Jerome, Que. According to the company, the Elmira plant was not large enough for economical operation under the present conditions in the trade.

The Elmira plant had been making 6,000 pairs of footwear a day at the time it was closed down, and it had a capacity of 12,000 pairs daily. The shut-down will affect 80 Elmira families, some of whom had more than one member employed at the factory, but all old employes have been placed in positions in the factory of the Merchants Rubber Company, another Dominion Rubber subsidiary at the nearby town of Kitchener, Ont.

PETERS UNION FACTORY SUSPENDS PRODUCTION

The factory of the Peters Union, A. G., Frankfort-on-the-Main, Germany, suspended manufacturing activities and closed down on September 20. This company, which was engaged principally in the manufacture of rubber tires, was taken over by the Continental Caoutchouc & Gutta Percha Company of Hanover some time ago, and the latter announces that unfavorable economic conditions in general and the depression in the trade have compelled it to take this step.

As a result of this action, the production of technical rubber products by this factory will be transferred to the Continental plant at Corbach and that of tires at Hanover. The greater part of the sales organization established at Frankfort will be maintained, but about 275 workers and 70 office employees have been dismissed from the factory.

F. R. Henderson Moves

Offices of the F. R. Henderson Corporation, crude rubber brokers and Rubber Exchange members, have been moved to 89 Broad Street, New York City. The firm was formerly located at 44 Beaver Street.

Consulting Rubber Technologist

PRACTICAL

Twenty years' experience with the largest and most successful companies in the country

Physical and Chemical Testing
Special facilities for abrasion and quick age tests

Expert Advice to Correct Factory Trouble

New Processes and Formulas Developed

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German Tire Price Cut

German tire manufacturers, acting together through the Verein Deutscher Gummifenfabriken, reduced prices on all automobile and truck tires from 10 to 30 per cent on October 1. There are rumors of a further reduction being planned to go into effect on January 1.

P. Y. SMILEY RETURNS TO CANADIAN GOODRICH

The return of Pearl Y. Smiley as development manager of the footwear division of the Canadian Goodrich Company was recently announced by E. S. Sargeant, general manager of the Kitchener factory. Mr. Smiley is well known among rubber men both in Canada and the United States.

About thirty years ago, Mr. Smiley started with the Maple Leaf Rubber Company in

P. Y. SMILEY

Port Dalhousie, Ontario, his home town. A few years later, he joined the Berlin Rubber Company in Kitchener. His next move was to help organize the Merchants Rubber Company, taking over the office of superintendent.

To these duties was added that of superintendent of the Maple Leaf factory which had become part of the Dominion Rubber System. From 1916 to 1920 he served as footwear factory manager of the various plants in the Dominion System. In 1920, he associated with the Ames Holden Rubber Company as superintendent of tires and footwear, which position he continued to hold when Goodrich bought the Ames Holden Company in 1924.

His work was so outstanding that the parent company, the B. F. Goodrich Rubber Company in Akron, transferred him to the latter city as their footwear development manager. With the transfer of the Akron footwear division to Watertown, Mass., in consolidation with Hood Rubber Company, Mr. Smiley's return to the Canadian Goodrich plant was requested and has been granted.

EDWIN A. BINDER, of George F. Jones & Sons, and HERMAN WEINSTEIN, of M. Rothschild & Company, have applied for membership on the Rubber Exchange of New York.

RUBBER ROAD PROGRESS IS RETARDED BY PRICE

The reasons why the use of rubber as a material for road building has not made greater progress were explained in a statement in the London *Morning Post* earlier this month. Despite the deflation of crude rubber to the lowest price quotations in history and the constant agitation for means to reduce traffic noises, little advance has been made in the construction of rubber roadways.

There are only three sections of rubber roadway in the Metropolitan area of London, one in New Bridge street, another in Thurlow place, Kensington, and a third at Penge. Since these were laid down, two sections have been completed in Glasgow, and sections have also been constructed in Edinburgh, Bristol, and Newcastle.

An official of the City Corporation informed a representative of the *Morning Post* that rubber street paving still cost twice as much as wood paving blocks, and it was not yet possible to say that the surface lasted twice as long. The New Bridge street section, which had recently been repaired, had undergone repairs on two or three occasions previously during the four years of its existence.

He pointed out that rubber had not yet been used as paving for a sufficiently long time to enable the manufacturers to gain the necessary experience regarding the best mixture from the point of view of durability.

"Rubber is not the only ingredient used in the manufacture of road blocks," he said. "Some of them are made of concrete or brick with a rubber cap, and this explains why the cost of production is still comparatively high. Although there is no immediate prospect of further sections of rubber roadway being laid in the city, the Corporation are always prepared to consider further experiments."

It was stated by a representative of British Rubber and Associated Productions, Ltd., manufacturers of rubber road blocks, that the fall in the cost of production had not kept pace with that of the price of the raw materials. He added that the early difficulty experienced of finding suitable methods of keeping the blocks in position when laid had now beeen practically overcome.

"In other respects," he said, "I understand that the sections of road laid with rubber blocks have given satisfactory results. The wear and tear is barely perceptible, and there is less tendency for vehicles to skid on rubber surfaces than on smooth wood surfaces, since the tires easily grip the yielding surface. I fancy that the high cost is the only present obstacle to a great extension of the use of rubber for road-making."

CATALPO

for

Cushion Stocks

LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, OCTOBER 21, 1930

RUBBER

Crude

NARROW price fluctuations prevailed during the fortnight, with the spot price quotation for ribbed smoked sheets closing on October 21 at the same figure as on October 3. According to recent figures of Malayan dealers' stocks and Netherlands Indies exports, present low prices seem to be effectively restricting the production of crude rubber, but owing to the huge visible supply and the subnormal rate of consumption, there has been no price advance.

On retiring as president of the Rubber Exchange of New York, F. R. Henderson issued a distinctly bullish statement. "It seems quite clear," he declared, "that the world's requirements can not be produced at today's level of price. It is all very well to use low cost as an argument to justify low levels, but the amount of such low cost rubber must be considered. As in all commodities, the marginal cost is the ultimate influence. I believe this cost of the balance needed is 15 or 16 cents land New York, and while it may take time, the market will respond to this cost. Markets usually have a habit of discounting the inevitable, and rubber at the present level should be one of the leaders in commodity price recovery."

Prices quoted on the New York outside market on October 21 were as follows:

Plantations—

Ribbed Smoked Sheets—			
Spot-Oct.	.08⅛	@	.08⅜
Nov.-Dec.	.08⅛	@	.08½
Jan.-Mar.	.08½	@	.08¾
First Latex, crepe spot	.08¼	@	.08½
Amber Crepe, No. 2	.07½	@	.07¾
Amber Crepe, No. 3	.07⅜	@	.07⅝
Amber Crepe, No. 4	.07	@	.07¼
Brown Crepe, Clean thin	.07⅛	@	.07⅜
Brown Crepe, specky	.06⅞	@	.07⅛
Liquid Latex, per gal.	.75	@	.85

Paras—

Up-river Fine	.12	@	—
Up-river Medium	Nominal		
Up-river Coarse	.07	@	—
Acre Bolivian, fine	.12	@	—
Caucho Ball, Upper	.07	@	—
Islands, fine	Nominal		

Centrals—

Central, scrap	—	@	.07
Esmeraldas	—	@	.07

Balata—

Block, Colombia	Nominal		
Block, Ciudad	.41	@	.42

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot-October	4	@	4⅛d
Nov.-Dec.	—	@	4⅛d
Jan.-Mar.	—	@	4¼d

SINGAPORE MARKET

(Holiday)

Scrap

That some business, although of small quantity, has been done in scrap rubber is considered encouraging in view of the record low price of the crude commodity. Reclaimers are now increasing their production schedules cautiously, but will soon be forced to replenish their diminished stocks by more active output. Late prices follow:

(Prices to Consumer)

Auto tire peelings	ton	23.50	@25.00
Mixed auto	ton	12.00	@12.50
Bicycle tires	ton	9.00	@10.00
Clean solid truck tires	ton	24.50	@26.00
Boots and shoes	cwt.	1.10	@ 1.25
Arctics, untrimmed	cwt.	.90	@ 1.00
Inner tubes, No. 1	lb.	.05¼	@ .05½
Inner tubes, No. 2, compounded	lb.	.02⅛	@ .02¼
Inner Tubes, Red	lb.	.02¼	@ .02⅜
Air Brake Hose	ton	10.00	@12.00
Rubber Hose	ton	9.00	@10.00

Reclaimed

Due to the marked drop in crude rubber consumption during September, the percentage of reclaim used showed a sharp increase although the actual quantity was less. Many reclaims now cost more than crude, some actually so in cents per pound, others relatively so because of differences in gravity. Late prices follow:

High Tensile

Super-Reclaim Black	lb.	.08½	@	.08⅝
High Tensile Red	lb.	.08¼	@	.08½

Shoe

Unwashed	lb.	.06	@	.60¼
Washed	lb.	.08	@	.08¼

Tube

No. 1 (Floating)	lb.	.08½	@	.08¾
No. 2 (Compounded)	lb.	.07½	@	.07¾

Tires

Black	lb.	.05¾	@	.06
Black, selected tires	lb.	.06	@	.06½
Dark Gray	lb.	.07	@	.07½
Light Gray	lb.	.07¾	@	.08
White	lb.	.08¾	@	.09
Truck, Heavy Gravity	lb.	.06	@	.06¼
Truck, Light Gravity	lb.	.06¼	@	.06½

Miscellaneous

Mechanical blends	lb.	.05	@	.05½

COTTON and FABRICS

Cotton

THE past fortnight has seen only narrow fluctuations in the price of cotton, the commodity closing approximately 10 points higher than at the end of the previous period. The crop forecast of 14,486,000 bales issued by the Department of Agriculture indicates that the total supply of American cotton this season will approximate 20,700,000 bales, the carry-over last July having amounted to 6,187,000 bales.

In the textile markets September sales probably exceeded full production and are the largest for many months, but the trade looks for only a little increase in the production of goods before the beginning of the year. While large, the sales follow a long period of hand-to-mouth buying and are considered no more than seasonal.

The high, low and closing prices on the New York Cotton Exchange on October 21 follow:

	High	Low	Close Oct. 21	Close Oct. 4
Oct.	10.31	10.25	10.30	10.21
Dec.	10.51	10.45	10.50	10.42
Jan.	10.64	10.60	10.64	10.50

Tire Fabrics

The tire industry used 17,630,579 pounds of cotton fabric in August as against 21,937,827 pounds in August, 1929. In the eight months of 1930, consumption totaled 159,119,569 pounds, compared to 216,937,827 pounds in the same period last year. Late prices follow:

CORD

Peeler, carded, 23/5/3	lb.	.36	@	.36¼
Peeler, carded, 23/4/3	lb.	.38	@	.38¼
Peeler, carded, 13/3/3	lb.	.33½	@	.33¾
Peeler, carded, 15/3/3	lb.	.34	@	.34¼
Egyptian, carded, 23/5/3	lb.	.45	@	.45½
Egyptian, combed, 23/5/3	lb.	.51	@	.51½

CHAFERS

Carded, American, 8 oz.	lb.	.29	@	.29½
Carded, American, 10 oz.	lb.	.28½	@	.29
Carded, American, 12 oz.	lb.	.27½	@	.28½
Carded, American, 14 oz.	lb.	.26	@	.27

LENO BREAKER

Carded, American, 8¼ oz.	lb.	.28	@	.33
Carded, American, 10¼ oz.	lb.	.28	@	.33

SQUARE WOVEN

Carded, American, 17¼ oz. 23-11 ply	lb.	.36	@	.36½
Carded, American, 17¼ oz. 10-ply	lb.	.26	@	.26½

Sheetings

The market for sheetings closed the fortnight without any change in price, other than fractional adjustments on one or two grades. Latest prices, as reported by the Textile Brokers Association, follow:

40-inch, 2.50-yard	yd.	—	@	.08½
40-inch, 2.85-yard	yd.	—	@	.07½
40-inch, 3.15-yard	yd.	—	@	.08½
40-inch, 3.60-yard	yd.	.07	@	.07¼
40-inch, 3.75-yard	yd.	.06⅛	@	.06¼
40-inch, 4.25-yard	yd.	—	@	.05½

Ducks

All grades of cotton ducks experienced a sharp decline during the fortnight, hose and belting being particularly affected. The latest price quotations for the various grades were as follows:

Belting and Hose	lb.	.25	@	.26
Enameling	lb.	.28	@	.31
Single filling	lb.	.11½	@	.12½
Double filling	lb.	.13	@	.14

CHEMICALS

WHEN an outstanding authority such as Colonel Ayres of Cleveland considers that "a real tire shortage is in the making," there seems to be little doubt but that the industry will have to accelerate its production schedules within the next few weeks. Consumption of rubber chemicals and compounding ingredients, which was at the lowest level for the year during September, will, therefore, increase in proportion. Some manufacturers are already preparing to place contracts for some of their requirements for 1931, while others have yet to complete their needs for the present year. The price structure for these materials has remained firm during the fortnight.

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.80 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Dipsol	lb.	4.30 @	4.50
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.75 @	—
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 397	lb.	.75 @	.77½
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermio F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.25½@	.28½
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08½@	.08¾
Litharge, domestic	lb.	.07¾@	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)			
Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Oximony	lb.	.13¼@	—
Red oxide, pure	lb.	.10 @	.12
Smith's 444 Crimson f.o.b. Springfield	lb.	.08¾@	.10
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Venetian red	lb.	.08 @	.06
Vermillion, quicksilver, English	lb.	1.75 @	1.80
Whites			
Lithopone, Akeolith	lb.	.05 3/5@	.06
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox B, f.o.b. St. Louis,	lb.	.07¼@	.07¾
Titanox C, f.o.b. St. Louis,	lb.	.07¾@	.08¼
Zinc Oxide—American Process			
American Azo: ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅜@	.06⅞
Horsehead Brand: Special	lb.	.07 @	.07½
XX Green	lb.	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅜@	.10⅞
blue label	lb.	.09⅜@	.09⅞
red label	lb.	.08 @	.08½
Zinc Oxide—French Process			
White seal	lb.	.11⅜@	.11⅞
Green seal	lb.	.10⅜@	.10⅞
Red seal	lb.	.09⅜@	.09⅞
Yellows			
Chrome	lb.	.17 @	.17½
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01¾@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.07½@	.07¾
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blacks			
Arrow "Aerfloted"	lb.	.04½@	.09½
Bone Black	lb.	.06 @	.12½
Carbon, compressed	lb.	.04 @	.08½
Carbon, uncompressed	lb.	.04 @	.08½
Disperso, f.o.b. Louisiana	lb.	.041 @	—
Disperso, f.o.b. Texas	lb.	.04 @	—
Drop Black	lb.	.06 @	.14
Fumonex	lb.	.04 @	.07½
Excello, compressed	lb.	.05 @	.09
Gastex, f.o.b. Texas	lb.	.04 @	.05¼
Lamp Black	lb.	.10 @	.40
Micronex	lb.	.04½@	.09½
Thermatomic-Thermax	lb.		
Flex	lb.		
P-33	lb.		
United carbon, fob Tex.	lb.	.04½@	.09½
Velvetex carbon	lb.	.03 @	.06
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	8.00 @	20.00
Colloidal	lb.	.05 @	.08
Congaree c. l. f.o.b. mine	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Mineral Flour, c.l. f.o.b. mine	ton	20.00 @	23.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, white water grnd.	lb.	.06 @	.08
Off color (biotite)	lb.	.05 @	.07
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.62 @	3.92
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	— @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.23 @	.24½

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Paradura	ton	62.50 @	65.00
Parmr, solid	ton	28.00 @	48.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	.34½@	.36
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.08 @	.09¾
Cottonseed, crude		.07 @	.07¼
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	— @	.07
Niger	lb.	.05¼@	.05¼
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.15 @	.20
Pine, steam distilled	gal.	.65 @	.70
destructively distilled	gal.	.50 @	.55
Witco Palm Oil	lb.	.11 @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb.	bbl.	— @	6.12½
Pigmentar	gal.	.16 @	.21
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	.11 @	.12
Alcohol, denatured, No. 1 bbls.	gal.	.40 @	.44
Benzol, 90%	gal.	.21 @	.23
Carbon, biculphide	lb.	.05½@	.06¼
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.35 @	.40
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.41½@	.42
wood	gal.	.38 @	.39
destructively distilled	gal.	.34 @	.35
Waxes			
Beeswax, white	lb.	.51 @	.53
Carnauba	lb.	.30 @	.34
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refined, 125/127	lb.	.03⅝@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

Agerite, Resin	lb.		
Powder	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

THE lowest domestic consumption of crude rubber for any month of the present year, combined with the lowest amount of re-exports in several years, brought stocks of the commodity in this country up to a new high level of 169,607 long tons at the end of September. Stocks afloat to the United States were slightly less at 60,923 tons, making a total visible supply of 230,530 long tons.

British warehouse stocks have also been continuing their upward trend, making new high records at every week-end. The total for London and Liverpool on October 18 was 120,313 long tons as compared with 117,994 long tons on September 25. Stocks at Singapore and Penang, however, showed a total falling off of about 4,000 long tons by the end of September.

Automobile production in September fell slightly below the August output, which had previously been the low mark for the year. Rim production for last month was also the lowest for 1930. Output of casings and tubes was below shipments for the third consecutive month, bringing stocks of the former to the lowest point since October, 1928, and stocks of the latter under any month since December, 1925.

Latest figures covering exports and imports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,665	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,836	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,993	12,215,848	13.79	3,125	1,027,136	14.67	36,868
July	35,182	10,553,944	13.39	2,732	736,863	12.04	32,450
Aug.	35,713	9,666,362	12.08	2,194	646,667	13.16	33,519
Sept.	35,380	8,460,812	10.68	1,509	429,789	12.72	33,871
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1923	1924	1925	1926	1927	1928	1929	1930
Jan.	30,106	29,058	29,638	32,196	31,518	34,403	43,002	36,669
Feb.	30,149	25,736	29,761	31,136	30,137	33,702	41,594	32,726
Mar.	36,629	28,385	33,498	32,936	36,141	35,688	44,730	35,914
Apr.	29,085	27,129	34,139	32,696	35,871	32,772	47,521	40,207
May	36,155	25,845	35,822	29,364	34,592	37,333	49,233	39,902
June	24,272	22,753	35,822	28,598	33,801	37,676	43,227	34,463
July	17,685	23,396	36,053	27,577	29,219	37,407	41,526	29,245
Aug.	20,359	28,982	35,909	34,533	33,460	42,927	38,274	30,575
Sept.	17,594	31,497	31,691	32,904	27,214	39,882	34,707	25,288
Oct.	21,321	31,520	29,047	29,836	26,790	40,857	34,800	
Nov.	20,437	27,289	28,853	28,080	26,792	37,461	27,659	
Dec.	31,902	27,199	28,748	26,293	25,492	31,232	23,531	
Totals	305,694	328,769	388,481	366,149	371,027	441,340	469,804	

Figures on Quarterly Basis

Quarter	1923	1924	1925	1926	1927	1928	1929	1930
Jan./Mar.	96,776	87,609	95,263	94,301	99,216	103,558	128,565	101,610
Apr./June	89,493	75,674	104,099	87,109	103,242	103,500	139,292	112,092
July/Sept.	55,621	83,813	99,493	93,793	89,210	117,573	113,746	
Oct./Dec.	73,617	92,656	85,789	83,212	80,860	117,597	84,872	
Totals	305,507	339,752	384,644	358,415	372,528	442,227	466,475	

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
July 12	6,594	315	1,537	6	8,452
July 19	4,898	270	1,317	22	6,507
July 26	5,495	435	1,521	—	7,451
August 2	6,531	914	996	7	8,448
August 9	5,397	914	1,939	—	8,250
August 16	6,177	820	1,810	25	8,832
August 23	7,498	488	1,503	—	9,489
August 30	5,796	1,043	1,662	—	8,501
September 6	8,963	1,607	1,724	—	12,294
September 13	5,879	1,177	2,001	20	9,077
September 20	5,214	1,229	1,314	20	7,777
September 27	4,367	729	1,762	—	6,858

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1928																															
May	17½	17¾	18¼	19¼	19¼	18⅝	19¼	18⅝	18⅝	18⅞	18⅞	—	19	19	19	19¾	18¾	18⅝	—	18¾	18¾	19	19¼	19¾	20⅛	—	20¼	20	—	19¾	19
June	19¾	19¾	19¾	19¾	—	19¾	19⅝	—	19½	19½	19½	—	19½	19¾	19⅝	19⅝	19⅝	19⅝	19⅝	19⅞	19⅞	—	19½	19¾	19⅝	19¾	19¾	19¼	19¾	—	19½
July	—	18¾	—	19	19	19	—	19¼	—	19½	19¾	19⅝	19⅝	19⅝	19⅝	—	19⅝	19⅝	19⅝	19¾	19¼	18	—	19¾	19⅝	19	19	19	19	19	19½
August	19½	19½	18⅞	19¾	18⅝	19⅜	19⅜	20	19⅝	19⅝	18½	18½	18½	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19¾	18	19	—	19¾	19⅝	18½	18½	18½	18⅝	18¾	18½
September					18⅝	18⅝	—	18⅝	18⅝	18⅝	18½	18½	18¾	18½	18½	18½	18½	18½	18½	19	19	19	19	19	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝
October	18⅝	18½	18½	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	—	18¾	18¾	18¾	18¾	17¾	17¾	17¾	18	18	18	18	18	18	17¾	17¾	17¾	17¾	18⅛	18⅛
November	18⅝	18⅝	—	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18	18	18	18	18	18	17¾	17¾	18	18	18	18	18	18	18	18	17¾	17¾	17¾	17¾	18⅛	18⅛
December	17⅝	—	17⅝	17⅝	18⅛	18	18	—	18	18	18	18	18	18	18	—	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
1929																															
January	—	18⅛	18⅛	18⅛	18⅛	18⅛	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝
February	22⅝	22	21⅝	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼
March	26	26	26	26	26	26	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾
April	23	23½	—	22¾	22¾	22½	—	22¾	22¾	22¾	—	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾
May	19¾	19¾	19¾	19¾	—	20¼	21½	21	21	21	—	22½	22½	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾	22¾
June	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	20½	20½	20½	20½	20½	20½	20½	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
July	20¾	21	21	21	21	21	22	22	22	22	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
Aug.	21¾	21	21	21	21	21	22	22	21¾	21¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾
Sept.	—	—	20¼	20¼	20¼	20¼	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾
Oct.	19¾	19½	19¾	19¾	19¾	17	17¾	16¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾	20¾
Nov.	17¾	17¾	—	17¾	17¾	17¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾
Dec.	—	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½	16½
1930																															
January	—	15¾	15⅝	15⅝	15⅝	15⅝	15⅝	—	15⅝	15⅝	15⅝	15⅝	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼
February	15¼	—	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼
March	15⅜	15½	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜
April	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½
May	14⅝	14⅝	14⅝	14⅝	—	13⅜	13⅜	13⅜	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼	14¼
June	—	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾	13¾
July	12¼	12	—	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
August	10⅝	10⅝	9¾	9¾	9¾	9¾	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼	10¼
September	—	9¾	9¾	9¾	9¾	9¾	9	9	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½
October	7½	7½	8¼	8	7¾	8	—	8	8	8	—	8	8	8	8	7⅞	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.93
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	8.28
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	——
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	——
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	——
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	——

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	July	Aug.	Sept.	Oct.	Day	July	Aug.	Sept.	Oct.
1	6⅛	5⅛	—	3⅝	17	6½	—	4⅛	3⅞
2	6¼	5⅛	4¾	3¾	18	5⅝	4¾	4⅛	3⅞
3	6⅛	—	4⅝	4	19	5⅝	4¾	4	—
4	6⅜	5¼	4½	4	20	—	4¾	—	4
5	6⅛	5	4½	—	21	5¾	4⅞	—	—
6	—	5	4⅛	3⅞	22	5⅝	4¾	3⅞	—
7	6⅛	5	—	3⅞	23	5⅝	4¾	3⅞	—
8	6	5	4	4	24	5½	—	3⅞	—
9	5⅞	5	4⅛	4	25	5⅝	4¾	3⅞	—
10	5⅞	—	4	3⅞	26	5⅝	4¾	3⅞	—
11	5⅞	4⅞	4⅛	3⅞	27	—	4¾	3⅞	—
12	5¾	4¾	4⅛	—	28	5¼	4¾	—	—
13	—	4¾	4	3⅞	29	5¼	4¾	3¾	—
14	5⅝	4⅞	—	3⅞	30	5¼	—	3⅝	—
15	5⅝	5	4	3⅞	31	5¼	—	—	—
16	5½	4⅞	4⅛	3⅞					

Average Monthly Price Per Pound

Month	1928 Pence	1929 Pence	1930 Pence	Month	1928 Pence	1929 Pence	1930 Pence
Jan.	19.310	9.942	7.471	Aug.	9.300	10.505	4.880
Feb.	15.713	11.875	7.948	Sept.	8.530	10.160	4.075
Mar.	12.736	12.135	7.595	Oct.	8.807	9.620	——
Apr.	8.864	10.490	7.391	Nov.	8.596	8.442	——
May	8.845	10.717	6.926	Dec.	8.570	7.958	——
June	9.293	10.580	6.195	Average			
July	9.312	11.065	5.648	for Year	10.656	10.291	——

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.	Day of Month	Sept.	Oct.
1	——	10.50	11	11.30	——	21	——	——
2	11.30	10.55	12	11.05	——	22	10.75	——
3	11.40	10.50	13	11.00	——	23	10.65	——
4	11.45	10.35	14	——	10.45	24	10.55	——
5	11.65	——	15	11.05	10.40	25	10.55	——
6	11.65	10.25	16	10.95	10.20	26	10.35	——
7	——	10.25	17	11.00	10.20	27	10.30	——
8	11.25	10.20	18	11.00	10.25	28	——	——
9	11.20	10.15	19	10.90	——	29	10.25	——
10	11.50	10.30	20	10.85	10.45	30	10.35	——
						31	——	——

Average Monthly Price Per Pound

Month	1928 Cents	1929 Cents	1930 Cents	Month	1928 Cents	1929 Cents	1930 Cents
Jan.	19.12	20.22	17.21	Aug.	19.28	18.62	12.03
Feb.	18.40	20.21	15.62	Sept.	18.67	18.83	10.85
Mar.	19.38	20.19	15.13	Oct.	19.62	18.46	——
Apr.	20.63	20.29	16.39	Nov.	19.84	17.53	——
May	21.58	19.41	16.43	Dec.	20.22	17.28	——
June	21.50	18.74	14.48	Average			
July	21.36	18.62	13.10	for Year	19.97	19.03	——

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1928	ON HAND 1929	ON HAND 1930	AFLOAT 1928	AFLOAT 1929	AFLOAT 1930	ON HAND AND AFLOAT 1928	ON HAND AND AFLOAT 1929	ON HAND AND AFLOAT 1930
Jan.	110,244	76,342	126,068	46,441	93,330	65,483	156,685	169,672	191,551
Feb.	108,955	90,058	134,790	48,044	75,790	71,015	156,999	165,848	205,805
Mar.	114,061	100,536	141,843	43,378	67,065	63,646	157,439	167,601	205,489
Apr.	113,083	107,659	148,272	32,783	65,793	63,261	145,866	173,457	211,533
May	105,356	97,192	146,179	33,145	65,753	68,168	138,501	162,985	214,347
June	90,196	92,061	151,485	38,392	54,668	58,657	128,590	146,729	210,142
July	83,242	92,535	152,001	42,943	46,145	58,326	126,185	138,680	210,327
Aug.	68,994	90,769	158,178	54,904	49,422	61,168	123,898	140,192	219,346
Sept.	68,851	84,362	169,607	52,692	58,758	60,923	121,543	143,120	230,530
Oct.	66,421	88,483		45,646	59,180		112,067	147,663	
Nov.	61,956	92,219		75,502	62,358		137,458	154,577	
Dec.	66,166	118,609		92,037	62,388		158,203	180,997	

(Rubber Manufacturers' Association figures raised to 100%.)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1928	1929	1930	At end of	1928	1929	1930
Jan.	66,524	25,191	60,434	July	35,429	30,080	81,048
Feb.	62,964	25,554	64,557	Aug.	32,084	35,605	
Mar.	58,272	28,214	68,923	Sept.	31,440	42,188	
Apr.	53,425	31,368	74,676	Oct.	24,207	47,803	
May	44,628	31,290	77,312	Nov.	17,775	52,454	
June	38,756	31,025	80,260	Dec.	19,815	54,304	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1930					
May	75,540	76,118	76,982	76,953	77,168
June	77,616	78,104	78,888	79,699	
July	80,060	80,501	80,814	80,845	
August	80,379	80,044	80,224	80,618	80,611
September	81,830	82,233	82,648	83,136	
October	81,544	82,245	83,102		

Stocks in Liverpool

1930					
May	23,877	23,755	24,448	24,722	25,526
June	25,320	26,646	27,354	27,493	
July	28,143	28,226	28,126	28,381	
August	28,404	28,660	29,048	29,673	29,789
September	31,159	31,796	34,085	34,858	
October	36,378	37,244	37,211		

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1928	1929	1930	End of	1928	1929	1930
Jan.	25,868	29,617	39,727	July	18,663	33,859	45,459
Feb.	22,867	32,373	44,371	Aug.	18,971	30,834	48,132
Mar.	20,538	29,487	45,657	Sept.	14,898	32,138	44,015
Apr.	16,946	26,474	48,473	Oct.	12,149	33,770	—
May	17,437	30,764	44,715	Nov.	29,188	30,963	—
June	18,207	30,403	42,451	Dec.	32,895	35,548	—

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Jan.	44,740	28,440	2,134	5,400	3,668
Feb.	41,955	28,180	2,159	5,000	4,370
Mar.	39,206	27,510	2,220	4,759	4,578
Apr.	39,758	23,580	2,204	4,000	4,482
May	26,482	22,730	2,308	4,000	4,388
June	36,578	20,920	2,316	3,856	4,588
July	38,311	27,290	2,312		4,665
Aug.	39,482	29,000*			4,499

*Subject to revision.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1926	24,199,524	78.8
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1930			1930		
January	1,601,326	84.0	July	1,449,161	80.7
February	1,653,421	78.9	August	1,504,187	78.1
March	2,061,999	79.1	September	1,052,109	80.2
April	2,339,334	81.1	October		
May	2,010,067	84.3	November		
June	1,338,226	83.5	December		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944	73,308
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296	74,021
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624	12,627

Figures for Recent Months

	PRODUCTION 1928	1929	1930	SHIPMENTS 1928	1929	1930	INVENTORY 1928	1929	1930
Jan.	5,358	6,722	4,745	5,394	6,626	4,701	9,949	13,712	12,719
Feb.	6,363	6,912	4,859	5,031	5,282	4,474	11,721	15,495	13,238
Mar.	6,819	7,519	5,188	5,731	6,708	5,032	12,389	16,351	13,469
Apr.	6,178	7,884	6,024	5,812	7,294	5,429	12,717	16,929	13,948
May	6,759	8,145	6,099	6,457	7,184	5,564	13,024	17,849	14,327
June	6,692	7,304	5,464	7,117	7,254	5,647	12,162	17,957	14,163
July	6,498	6,475	4,257	7,895	7,855	5,810	11,157	15,830	12,599
Aug.	7,469	5,806	4,443	8,403	7,845	5,520	10,034	14,226	11,571
Sept.	6,802	4,758	—	7,145	5,998	—	9,705	12,875	—
Oct.	7,326	4,919	—	5,717	4,960	—	11,520	12,845	—
Nov.	6,075	3,603	—	4,998	3,558	—	12,579	12,935	—
Dec.	5,605	3,261	—	4,591	3,346	—	13,624	12,627	—

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180	78,417
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127	75,298
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117	13,660

Figures for Recent Months

	PRODUCTION 1928	1929	1930	SHIPMENTS 1928	1929	1930	INVENTORY 1928	1929	1930
Jan.	5,441	6,517	4,914	6,072	7,242	5,181	12,982	15,386	13,551
Feb.	6,895	6,769	4,943	5,431	5,278	4,627	14,650	16,999	13,905
Mar.	6,231	7,466	5,271	5,731	6,737	5,042	15,573	17,750	14,057
Apr.	6,661	7,634	5,877	5,702	7,164	5,172	16,638	18,134	14,704
May	7,168	7,660	5,904	6,300	7,038	5,412	17,702	18,928	14,775
June	6,953	6,978	5,280	7,136	6,950	5,616	17,159	17,741	14,518
July	6,674	6,178	4,201	8,729	8,113	6,246	14,974	16,332	12,434
Aug.	8,343	5,846	5,116	9,350	8,183	6,146	13,931	14,157	11,452
Sept.	7,103	5,536	—	7,154	6,250	—	13,543	13,424	—
Oct.	6,929	5,810	—	5,662	5,001	—	15,285	13,656	—
Nov.	5,592	3,780	—	5,002	3,712	—	15,743	13,701	—
Dec.	5,184	3,716	—	4,858	3,631	—	16,117	13,660	—

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	25,584	5,703	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,570	170,928	46,642	9,424	7,137	2,287	226,994
Dec.	119,950	92,717	27,233	5,495	4,426	1,069	125,445
TOTAL	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	346,940	297,483	49,457	15,548	13,021	2,527	362,488
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,630	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.	223,046	187,288	35,758	9,792	6,946	2,846	232,838
Sept.	222,931	180,956	41,975	7,957	5,623	2,334	230,888
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(*Long Tons*)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[5]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1928:															
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	73,952
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	1,059	1,922	733	67,233
June	40,398	14,344	26,054	5,563	1,122	1,061	547	422	5,582	6,693	11,270	757	1,398	548	61,017
July	46,454	15,071	31,383	5,457	974	1,247	641	462	6,422	7,192	13,995	575	1,457	543	70,348
Aug.	50,441	15,469	34,972	6,079	685	993	641	431	4,644	7,298	10,782	1,032	1,563	499	69,619
Sept.	53,484	12,392	41,092	7,993	384	832	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,937	12,516	35,421	8,381	812	1,047	671	485	4,697	8,295	10,512	893	1,606	445	73,265
Nov.	46,279	11,204	35,075	6,660	1,065	668	672	278	4,760	6,711	9,380	771	1,442	535	68,017
Dec.	46,147	15,018	31,129	8,683	900	930	672	320	5,189	8,279	11,102	966	1,674	443	70,287
1930:															
Jan.	52,535	11,773	40,762	7,741	1,560	791	600*	386	5,709	7,831	8,920	856	1,837	585	77,578*
Feb.	48,947	12,960	35,987	7,825	1,245	847	600*	469	6,900	7,191	11,414	944	1,797	480	75,699*
Mar.	47,320	13,236	34,084	6,269	1,129	976	600*	391	5,796	6,612	11,070	643	1,674	536	69,780*
Apr.	45,517	16,331	29,186	5,030	856	1,026	600*	366	4,802	6,326	12,582	433	1,201	630	63,038*
May	49,388	36,135	13,253	5,947	975	917	600*	350	6,352	6,661	11,916	753	1,383	555	49,662*
June	36,657	12,120	24,537	4,152	778	1,040	500*	392	4,728	4,776	9,512	425	974	551	52,365
July	41,347	12,759	28,588	4,619	792	1,087	500	327	6,022	5,891	9,770	648	810	418	59,472
Aug.	47,982	10,304	37,678	6,779		740	500	300	5,982	7,197	9,520	394	809		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(*Long Tons*)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	596,695
1929	526,709	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	892,739
1928:															
May	28,660	—5,322	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,063
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	31	337	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,331	5,179	5,001	4,613	2,908	2,727	1,259	684	1,131	627	113	226	115	356	86,270
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	996	1,437	854	201	468	37	277	71,234
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	695	2,215	672	687	507	24	520	65,737
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	253	519	30	465	68,201
Aug.	35,207	14,594	4,645	4,082	2,879	3,663	908	1,234	724	902	254	429	25	319	69,865
Sept.	32,171	17,010	3,889	4,691	1,908	3,511	1,224	1,235	853	672	253	361	91	477	68,346
Oct.	35,840	16,111	4,489	3,355	1,821	3,902	1,838	1,073	1,125	1,147	278	710	91	201	71,981
Nov.	40,972	13,141	3,082	3,776	2,709	3,221	1,275	1,226	1,453	861	253	595	62	313	72,439
Dec.	40,488	12,434	4,274	2,921	2,114	2,251	1,198	1,200	726	741	52	677	90	443	69,609
1930:															
Jan.	44,759	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	73,799
Feb.	40,718	10,293	4,482	3,697	2,250	1,386	1,385	2,705	457	1,143	188	315	200*	239	69,458
Mar.	42,068	12,346	4,354	4,289	3,776	2,663	1,083	168	975	678	358	322	200*	263	73,543
Apr.	42,961	13,058	5,006	4,488	2,303	2,769	2,067	949	673	1,431	158	461	200*	255	76,735
May	40,287	9,861	5,233	4,379	2,593	2,699	1,279	1,677	64	1,250	230	274	200*	346	70,427
June	37,257	9,645	4,458	3,794	2,579	2,677	1,378	1,454	67	691	343	507	200*	282	65,332
July	32,785	7,650	3,311	3,449	3,347		197		84	939	172	756	200*		

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are not included in this compilation; such imports amount to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 1,231 tons in 1929. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1929:				
September	5,507,000	21,702,000	2,841,000	5,906,000
October	6,116,000	22,386,000	3,502,000	5,887,000
November	4,395,000	17,863,000	3,400,000	4,932,000
December	2,291,000	14,781,000	3,003,000	4,751,000
1930:				
January	3,281,000	15,470,000	3,496,000	5,169,000
February	3,441,000	14,172,000	2,338,000	5,376,000
March	3,570,000	15,439,000	2,582,000	5,981,000
April	4,029,000	17,762,000	2,593,000	5,989,000
May	3,597,000	15,603,000	1,939,000	6,163,000
June	3,379,000	15,795,000	2,734,000	5,318,000
July	2,940,000	15,117,000	2,663,000	4,910,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
1929	1,231	545,175	728	566,964	8,203	2,458,126	447	167,479
1929:								
Sept.	107	51,156	38	30,327	913	279,225	—	—
Oct.	200	79,968	58	43,756	636	181,421	—	—
Nov.	125	47,796	13	11,600	583	182,677	49	14,935
Dec.	100	41,328	25	19,955	550	156,939	51	12,005
1930:								
Jan.	150	55,272	28	28,549	509	141,384	—	—
Feb.	75	25,956	52	45,319	367	93,087	—	—
Mar.	148	50,007	16	12,498	522	128,844	—	—
Apr.	75	19,856	58	54,548	410	103,089	—	—
May	172	57,760	17	13,645	602	144,415	—	—
June	168	51,561	52	47,000	532	120,424	45	16,649
July	93	26,000	24	17,463	45	102,325	—	—
Aug.	50	14,000	11	5,600	766	168,511	—	—

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

	Consumption					Consumption				
Year	Production	Tons	% to Crude	Stocks*	Year	Production	Tons	% to Crude	Stocks*
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,848	Aug.	19,049	17,890	41.7	15,881
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,283	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,187	Nov.	18,245	18,380	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,369
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.	18,865	18,744	53.8	25,117
May	20,385	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,980	Dec.	13,429	11,531	49.0	27,464
1930:									
Jan.	15,010	17,454	47.6	24,241	July	12,822	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,243	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	.....	.....	.....	.....
Apr.	17,828	16,904	42.0	24,587	Oct.	.....	.....	.....	.....
May	17,812	17,052	42.7	23,356	Nov.	.....	.....	.....	.....
June	15,714	14,063	40.8	24,449	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1929	1930	MONTHS	1929	1930
January	22,602,000	25,731,000	July	36,860,000	38,256,000
February	22,776,000	26,509,000	August	37,759,000	37,433,000
March	28,495,000	31,029,000	September	34,193,000	
April	32,019,000	34,549,000	October	32,816,000	
May	34,117,000	36,497,000	November	31,502,000	
June	33,163,000	35,902,000	December	26,550,000	

REVIEW DESK

Books, New Publications, Catalogues, Etc.

CHEMICAL ENGINEERING CATALOG. Fifteenth Edition. Published by the Chemical Catalog Company, Inc., 419 Fourth Avenue, New York City. 1930. 1168 pp. $10.

Regarded now as a standard work of reference for chemical engineers, works managers, purchasing agents and others who buy and specify equipment and materials in chemical process industries, the Chemical Engineering Catalog in its 1930 edition is as complete and useful as ever, with even more detailed information from companies as a particular feature. This volume presents collected, condensed and standardized catalog data of equipment, machinery laboratory supplies, heavy and fine chemicals and raw materials. It also includes classified indices, carefully cross-referenced, and a technical and scientific book section, cataloging and briefly describing an extensive list of books in English on chemical and related subjects.

CHEMICAL ENGINEERING AND CHEMICAL CATALOGUE. Sixth Edition. Edited by D. M. Newitt. Published by Leonard Hill, Ltd., 231 Strand, London, W. C. 2, England. 1930. 452 pp. 15s.

Announced as a comprehensive guide to every branch of the chemical industry, this volume contains a considerable amount of valuable data and useful lists. The chemical catalog section is said by the publisher to list practically every product manufactured in Britain, while the plant section similarly includes all machinery and equipment necessary to any production industry. Indices of manufacturers, trade names and applications are followed by a section of tables and technical data. About 1,000 technical and scientific books are arranged in a bibliography under subjects and authors, and authors and titles.

METHODS OF TEST RELATING TO ELECTRICAL INSULATING MATERIALS. Published by the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa. 1930. 196 pp. $1.25.

For several years Committee D-9 on Electrical Insulating Materials has been carrying on the work of the A. S. T. M. with respect to the study of tests and specifications for insulating materials, drawing up methods of testing and improving upon those now in use. The methods as drawn up in this volume give what are considered to be the best methods available at the present time. Three such standard methods and ten tentative methods of test prepared by the committee are included, together with eight specifications covering certain rubber and textile products which should be of interest in electrical testing and in particular to its practical application.

NON-DISCOLORING ANTIOXIDANTS. Published by the Rubber Chemicals Section, E. I. du Pont de Nemours & Company, Wilmington, Del. 1930. 2 pp. For free distribution.

The results of tests comparing Antox, Zalba and Parazone in the base stock for a high-grade pastel colored hot water bottle, using di-ortho-tolylguanidine as accelerator, are covered in this laboratory report.

THE ERA OF AUTOMATIC CONTROL. Published by the Brown Instrument Company, Wayne and Roberts Avenues, Philadelphia, Pa. 1930. 32 pp. For free distribution.

In hundreds of industries, automatic controls govern vital temperatures, pressures, flows, liquid levels and speeds for better service, economy and safety. It is the purpose of this attractively illustrated brochure to present a panorama of the scope of such control instruments and to describe the various types of controls in use.

TRENDS IN THE FOREIGN TRADE OF THE UNITED STATES. Published by the National Industrial Conference Board, Inc., 247 Park Avenue, New York City. 1930. 346 pp. $3.50.

Analyzing the many changes undergone by commodity trade since the World War and the factors underlying these changes, this volume treats particularly of the new status of the United States as a creditor nation. Major world markets for exports of the United States are studied in considerable detail, while our requirements for foreign products and the sources and amounts of the specified commodities are also detailed at length. The volume concludes with a general correlation of the data presented and an exposition of trends in our foreign trade.